Smithsonian

December 1991

Diminutive figure beckons from an 18th-century Neapolitan crèche (p. 100)

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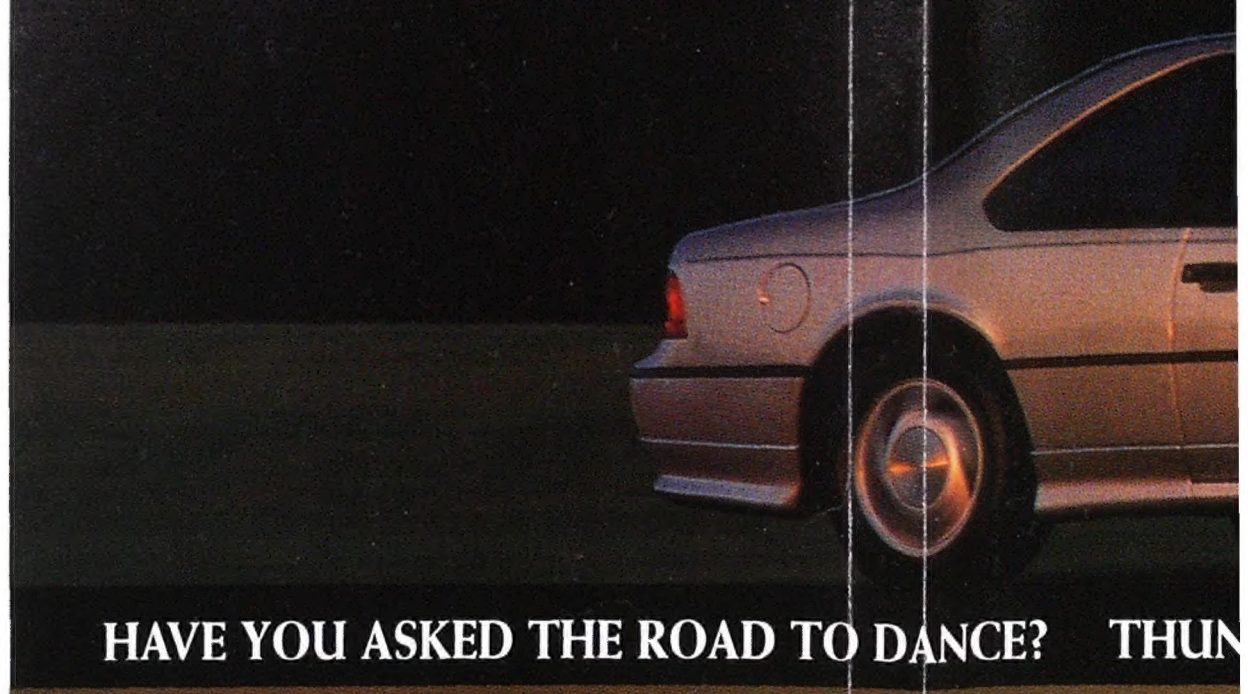

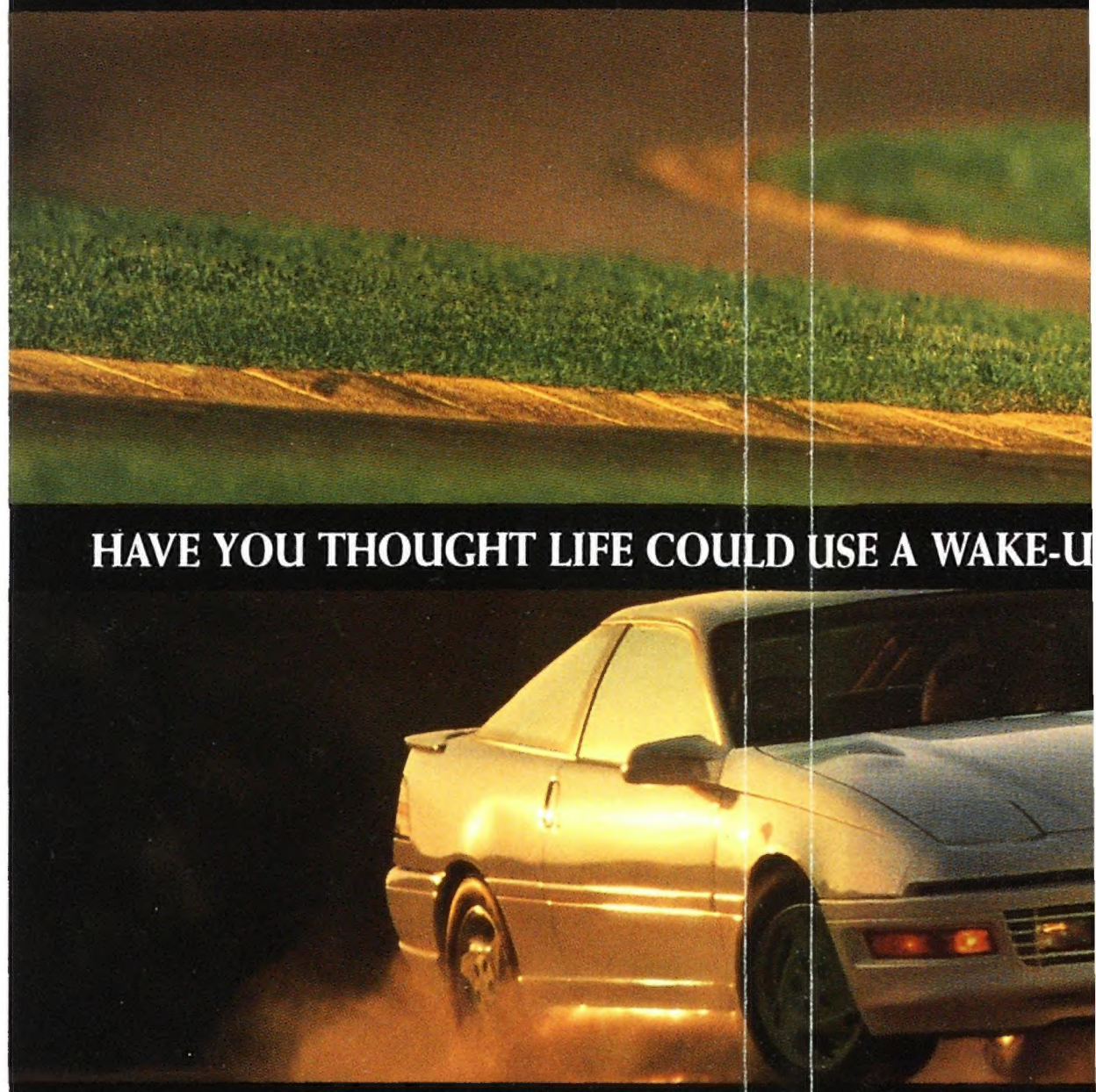

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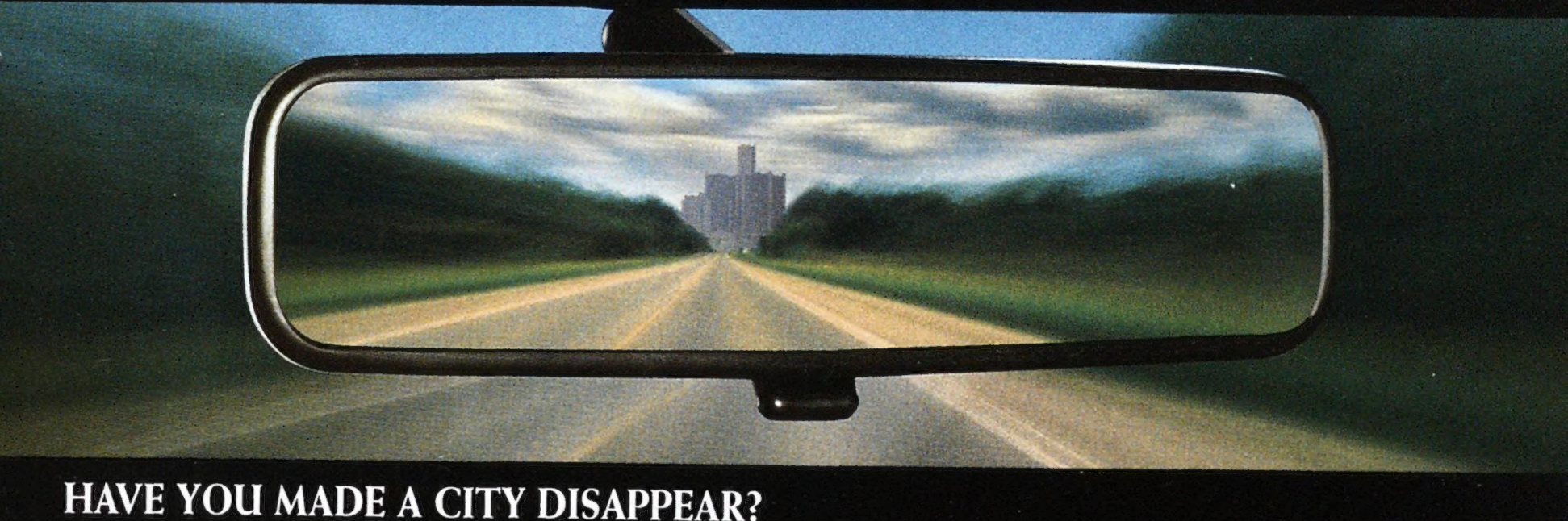
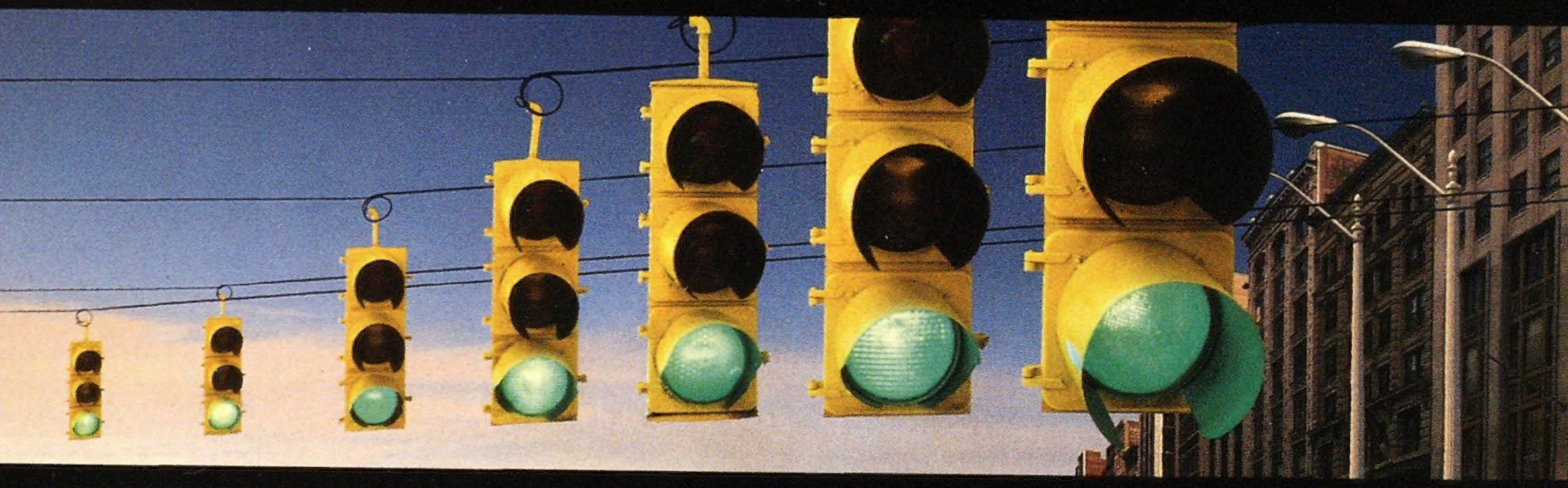


HAVE YOU MADE A CITY DISAPPEAR?

HAVE YOU ALWAYS HATED LONG GOODBYES?



HAVE YOU WISHED ALL THE LIGHTS IN THE WORLD WERE GREEN?

December 1991

Smithsonian

Volume 22, Number 9

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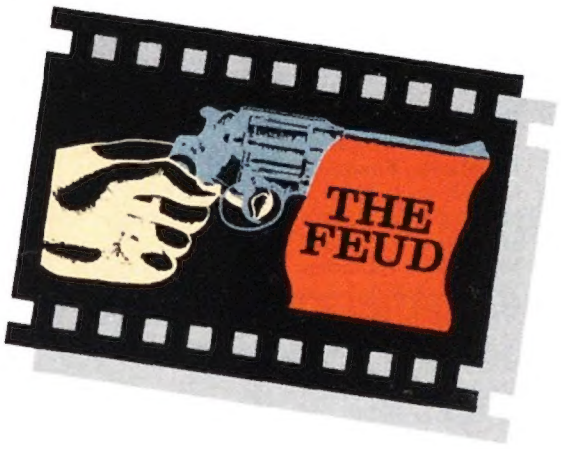

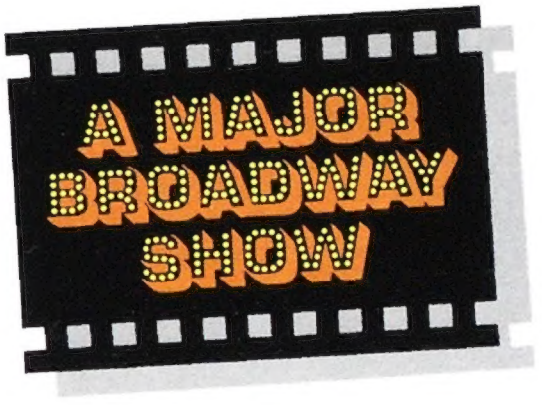

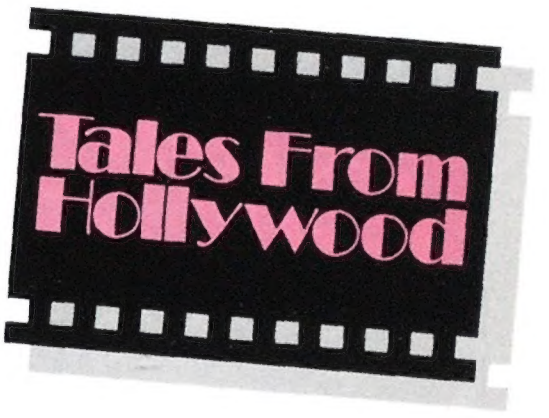

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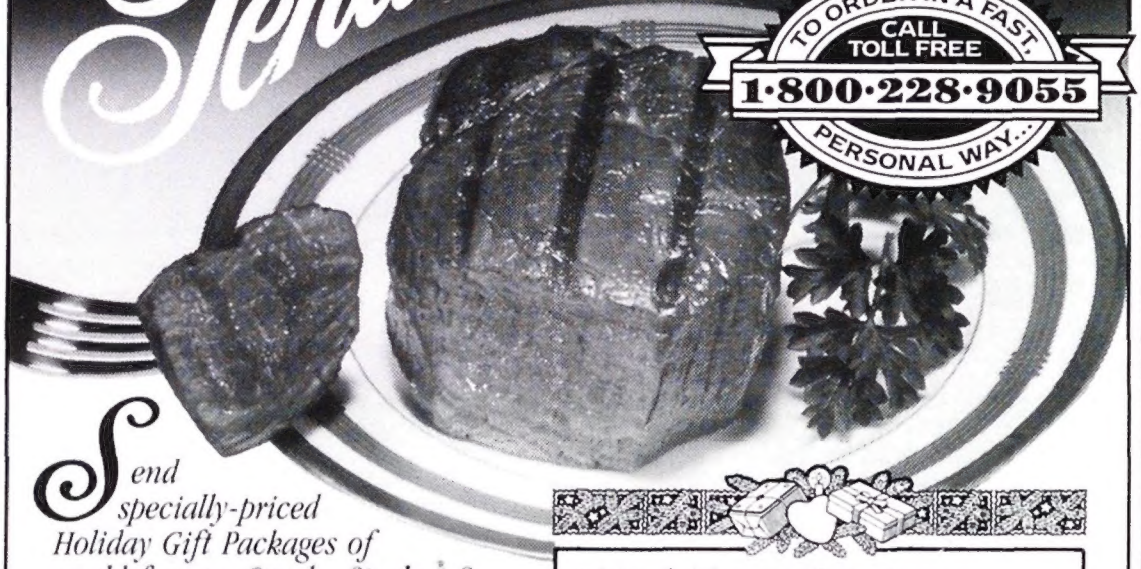

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Secretary Adams' comments

Smithsonian horizons

The educational and emotional impact of contemplating a reproduction may be as strong as the impact of an original

Candidly and compellingly, conductor Erich Leinsdorf recently has claimed the "demise of permanent musical leadership" and of the "principal type of music nourishing orchestras and chamber music ensembles." Playing a part, along with more immediate economic realities, has been the slow attrition of audiences, as public cultural life in central cities withers. But while recordings are a "welcome and useful convenience," Leinsdorf says, they probably bear an even larger share of responsibility. The resultant shift to "a lonely enjoyment of music at home" has corrupted, he suggests, "the indispensable social necessity of independent, live music performed spontaneously."

This depressing judgment sets one to thinking of usually unnoticed technological impacts on visual as well as aural experience, and thence on the changing "reality" that our eyes perceive and our minds construct. Consider photographic reproductions, of which, after a full century and a half of expanding uses, it is now somewhat easier to take a balanced measure. Borrowing heavily from Susan Sontag's fine *On Photography*, we learn that the photographic image is "a thin slice of space as well as time." Endlessly insinuating themselves into our lives, photographs "keep open to scrutiny instants which the normal flow of time immediately replaces. . . . But the truths that can be rendered in a dissociated moment, however significant or decisive, have a very narrow relation to the needs of understanding."

Television and motion pictures amplify the impact of photography, without fundamentally changing it. Reinforcing the cumulative effect of all these photographic images are immense and still-growing flows of electronically transmitted bits and bytes of computer-processed data. "Information" has become the approved descriptor. The Smithsonian is justly proud of its permanent exhibition on the Information Age. But the constraints implicated in this kind of information must be clearly recognized. It is infinitely manipulable and ethically neutral, and sharply to be distinguished from knowledge.

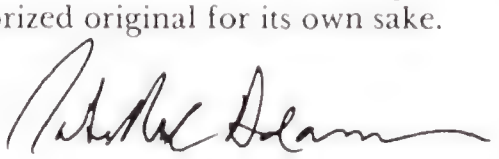
Today most of us acquire information about unfamiliar scenes and objects overwhelmingly through photographic images. How could they not affect our tolerance for discord and harmony, or what we recognize as art? As Sontag suggests, the photograph has "decisively transformed the traditional fine arts and the traditional norms of taste, including the very idea of the work of art. Less and less does the work of art depend on being a unique object. . . . photographs have become so much the leading visual experience that we now have works of art which are produced in order to be photographed."

With effects so pervasive, it should be no surprise that there is also an impact on museums. Art critic Hilton Kramer, a principal slayer of the dragons of "technocratic populism," notices our changing expectations of art museums, and notes that they will "shed convention, defy precedent, and shatter established values as often and as eagerly as the most incendiary avant-gardist of yesteryear." Disturbed that many of them are no longer palaces- or temples-of-art architecturally, he is even more concerned that many of the activities within them are no longer "object-oriented." For art at least, and by extension for cultural products of every kind, a direct encounter with originals is for him the irreplaceable essence of the museum experience.

I suppose such encounters once were as uniformly crucial as he suggests. But with all of its potential for mutual isolation and shallowness, as well as for immensely broadened horizons, the Information Age has forever changed that. Reproduced images flood our lives from every direction, many fleeting but others of fine quality that are sold by museums themselves to become constant companions in our homes. And even in museums, originals can seldom be reliably distinguished from duplicates except by experts.

Perhaps as epitomized by the Smithsonian, we should recognize that museums are not only multiplying but diversifying. As they seek to meet the needs of growing, more-differentiated audiences, it will not be a tragedy if only a declining proportion (not necessarily number) of museums forever regards reproduced objects, and even reproduced works of art, as anathema.

One alternative, with which we and others have only begun to experiment, involves introducing "virtual reality." This can confront the visitor on an overwhelming scale, as with an Imax theater screen, or stimulate several senses and demands for judgment simultaneously, as in the even more enclosing environment of a flight simulator for pilots. In either case, the educational and emotional impact—dependent upon context setting—can be at least as positive and dramatic as the contemplation of a prized original for its own sake.



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My VCR's control buttons cannot be read, saving me untold hours of taping programs I shouldn't be watching.

The local bank's ATM gives me other people's money because the well the cash ejects into is deep and walled instead of sloped, and whoever used it before me didn't see one of the bills he was offered. Its new NCR checks guard my privacy because a ballpoint pen isn't strong enough to leave an impression on the copy, so neither I nor anybody else knows who that check was to or for how much.

Automatic phones dial both of my numbers, so that if I fail to accept a sales pitch on the first phone by hanging up, I'm given another chance a moment later on the second line.

Because I bought a rain hat from a camping catalog, my name and address were sold to another dealer who recognizes me as a macho outdoorsman. I now get catalogs offering me sniper guns, death-dealing stilettos I can secrete on my person, and instruction manuals for making homemade mortar explosives.

My computer, made by a company so

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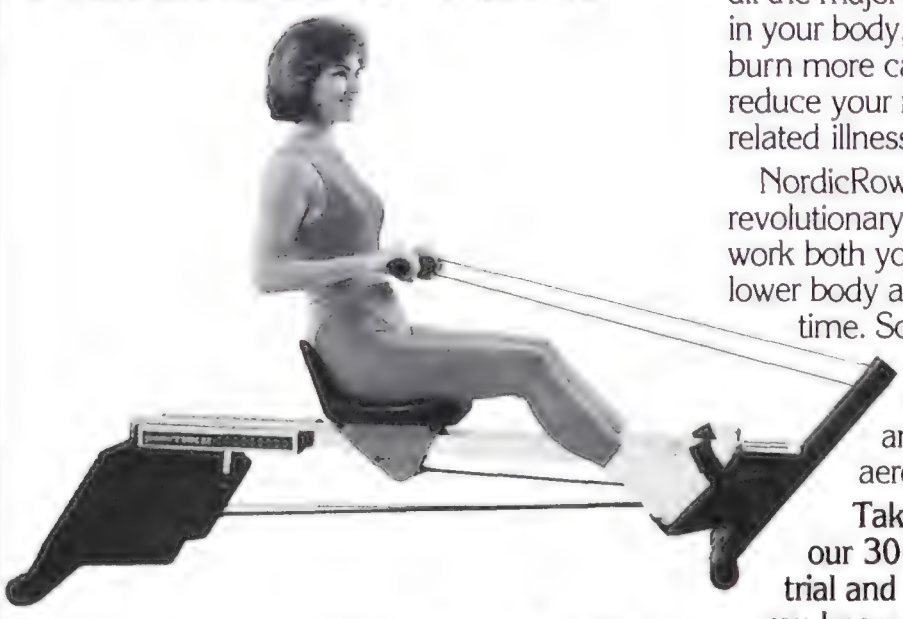

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au courant with technology that in five years it's brought out four newer models, has declared mine obsolete and no longer offers anything that works on it.
Marc Drogin
Exeter, New Hampshire

Dear Sir: I called customer service after using a "top of the line" stroller for a few weeks. Among its failings, the "convenient" rear-wheel locks would lock halfway up the front porch steps.

I was told "the stroller is not designed to go up and down stairs." Well, the architects of the world will just have to stop putting front steps on houses. Or are the design engineers 20-year-old males living in one-story monasteries? It is time these people get out into the real world and take "product testing" one step farther, into "reality testing."
Elaine Imus
Parowan, Utah

Dear Sir: What the author, and many like him, are saying is that they have never read the directions. Perhaps that is why they are still techno-boobs.
Bill Tucker
Southfield, Michigan

Great Lakes steamers

Dear Sir: I sailed on the SS *A. M. Byers* in the summer of 1922, when I was 15, as a commercial wireless operator. About 5,200-ton capacity, she was out of Milwaukee and took iron ore from Duluth or Superior, Wisconsin, to Ohio or Pennsylvania ports, returning with coal or cement.

Our captain worried because the iron ore usually weighed 4,800 tons, with the ship's draft at a given line; the weight of coal or cement was 5,200 tons at the same line. I explained repeatedly that ore was measured in long tons of 2,200 pounds, but coal and cement in short tons of 2,000 pounds—but he could never understand.

Our wireless equipment consisted of a 1-KW rotating spark transmitter with a galena detector. We could cover nearly 100 miles if conditions were right. One night, toward the end of the summer, we and a Norwegian freighter collided near Ashtabula, Ohio. We went in for repairs; I remained aboard as night watchman for the rest of the summer.

In Ashtabula I found a store that carried a new device, a vacuum tube, alleged to be more sensitive and reliable. I got one for the *Byers*, and that was

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the start of 60 years in electronics; I wound up as a vice president of General Electric.
George F. Metcalf
Portland, Oregon

Dear Sir: When I was a child during World War II, for four months each year I lived aboard various steamers. Dad was a wheelsman for Reiss Steamship Company. Crewmen were hired to serve as watchmen during winter layover, and were permitted to bring their families aboard. As money was tight, this enabled our family to get through the lean winter months.

It was a marvelous adventure, learning about the great port cities of the Midwest. I saw the rescue sub *Peto* built in the Manitowoc shipyards. Its launching was spectacular.

Sometimes we were in dry dock, and watching workmen scurry like ants way below me furnished many an afternoon's entertainment. The bumboats, delivering mail, personal items and sundries on the fly, also intrigued me.
Mrs. Harry Pierkowski
Denmark, Wisconsin

The potato

Dear Sir: Early in the 17th century, decades before the potato was widely recognized as a valuable antiscorbutic, Shakespeare's son-in-law Dr. John Hall, a widely respected consultant-physician, was miraculously restoring bedridden scorbutic patients to full health within weeks. The treatment: his own freshly brewed herb concoction containing, among other ingredients, "scurvy-grass" (*Barbari vulgaris*), with a content of ascorbic acid similar to that of orange juice. His clinical observations offer the best early descriptions of scorbutic symptoms in Britain at the time, preceding by 150 years those of Sir James Lind on prevention of scurvy with lime juice.
Henry M. Lemon, M.D.
Omaha

Edward Stratemeyer

On a trip to the Far East in 1986 I was startled to find, at the airport newsstand in Bali, copies of Nancy Drew books in translation!
Dorothy V. Ramm
Chicago

Dear Sir: The picture on page 51 is of Nancy Drew and pals George and Bess

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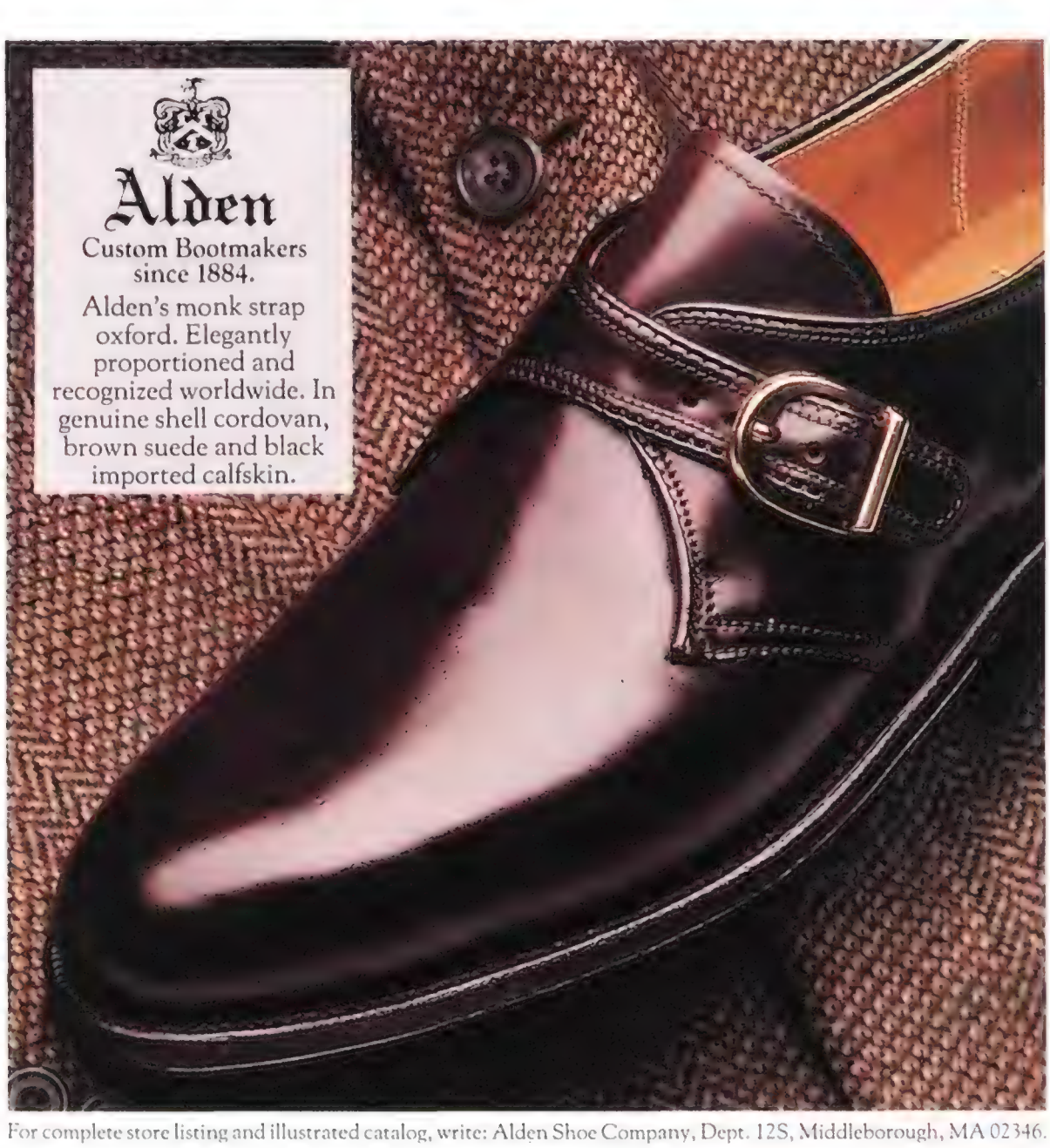
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in *The Hidden Window Mystery*, not the Dana Girls.
Anna Marie Etemadi
Alexandria, Virginia
Ms. Etemadi is correct. Ed.

Santa Catalina Island

Dear Sir: Raised on the Island (as we called it), I lived there until I went away to college. Mother was a press agent, hired by William Wrigley after he bought Catalina. She promoted weddings on aquaplanes in Avalon Bay, held all sorts of cross-channel races, from the famous swim of 1927 to speedboats and rowboats. I suffered the indignity of riding a swordfish behind a sport fishing boat for newsreel cameras, and was photographed astride a quite dead porpoise and hanging on to one of the Island's ubiquitous wild goats. And I posed holding flying fish in my hands.

My chief childhood assignment every Sunday morning was to row Mother among the yachts anchored in the bay so she could collect "items" from movie people and socialites for her weekly column in the *Los Angeles Examiner* (her byline was "Alma Avalon").
Miles H. Overholt
Edmonds, Washington

Dear Sir: I was a trumpeter with Kay Kyser's orchestra in 1942 and '43 and would like to correct your identification of Mr. Kyser as the man in the center, in the picture on page 162. Kyser is wearing the yachting cap [below].
Ray S. Linn
Vienna, Virginia
Mr. Linn is correct. There are various opinions on the identity of the man in the center, but the smart money seems to be on Benny Goodman. Ed.

In these pockets you could find several mislaid dollars, some tissues and a rather linty throat lozenge.

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Hawkins Futura

Around the Mall and beyond

Like thousands of other devotees of the National Air and Space Museum, I've quietly suffered the long absence of the World War I gallery. Last month it reopened with a splendid new presentation supported by Fokker, the Société National d'Etude et de Construction de Moteurs d'Aviation and the Smithsonian Institution Special Exhibition Fund. "Legend, Memory and the Great War in the Air" is a remarkable, revealing, sobering exhibit, designed to investigate our impressions of aviation in the first of the world wars and test them against the truth.

Few remember the Great War compared with the millions who survived World War II and the more recent conflicts. But as this exhibit makes clear, it was a time of international insanity.

Reeking and mud-smeared, the trenches stretched across France and Belgium, from Switzerland to the sea. Here, masses of troops benumbed by shell fire lived amid rotted skeletons still in uniform, flung from shallow graves by high explosives. In desperate, hopeless misery, they clambered "over the top" to stagger through curtains of machine gun fire on the senseless orders of politically motivated and sometimes incompetent Brass Hats. Over all of this horror, a few airmen took to the sky—spotting enemy positions, directing artillery fire, dropping bombs and hunting enemy aircraft.

Legends about that very small air war began sprouting while it was going on and have continued for three-quarters of a century. As a small boy in the 1920s, I—and thousands like me—helped them grow. We found it more fun to pretend we were battling in the clean sky than in the stinking muck. So we played our games of Richthofen versus the Allies, of Fokkers against Spads.

We devoured pulp magazines like *Aces* and *Sky Fighters*, and later coughed up 30 cents a ticket at our neighborhood theaters to see *Wings* and *Dawn Patrol*. The myths still linger. But the truth, as you soon learn in this new gallery, was that lone eagles did not affect strategy with their heroic ground attacks and chivalric duels at 10,000 feet. These were just cameos in the vast drama of 1914 to 1918.

Yet those air battles certainly produced extraordinary fliers, and the true stories about them are unquestionably the stuff of legends. My young friends and I understood the dangers of aviation and recognized that our heroes must have been peculiarly driven men. We didn't know how physically demanding was the mere process of piloting the old Spads, Fokkers, Nieuports, Sopwiths and Albatroses. I didn't realize it until this past October when *Air & Space/Smithsonian* published Jeffrey L. Ethell's fascinating description of flying restored versions of those planes today.

The enormous torque of a heavy engine on a tiny airframe meant you had to stand on a rudder pedal to keep right side up. "The vibration coming through the controls was turning my hands and feet numb," writes Ethell. When he tried a French Nieuport with a rotary

Though undeniably heroic, World War I pilots, like this one being helped with his parachute, played only a cameo role.

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engine (that's the kind where the whole engine rotates with the propeller), he found himself sprayed with castor oil. He notes that breathing this lubricant "had a predictable effect on service pilots' bowels, but a good dose of milk laced with brandy usually counteracted it."

Thus enlightened, I stared, along with curator Dominick Pisano, at the scenes of the World War I exhibit as they were being put together in NASM last fall. The gallery is arranged to start with the myths, so who better to meet you at the entrance than Snoopy cursing the Red Baron? From there you get a taste of other, older legends—the dime novels, the movies of the 1930s—before you meet the reality.

The craft of flying heavier-than-air machines was just about 11 years old when war broke out in 1914. A mere handful of people knew how to fly. Training methods were almost as primitive as the planes, which were only a shade more sophisticated than the Wright brothers' Flyer that hangs today inside the museum entrance.

Armies had little use for airplanes until aerial observation helped turn the tide of a couple of early battles. Then the Brass accepted the contraptions, and pilots started shooting one another in midair. The government and the press were quick to exploit them and turn the "aces"—those with at least five victories—into public heroes.

In truth, it took a daredevil just to take off in those days. And the pilot who could twist around in the sky and fire a machine gun at an enemy—who was shooting back—was a different breed. I thought of this as I looked overhead at the beautifully restored vintage planes—the Fokker D.VII, the Pfalz scout, the Sopwith Snipe. I thought of what I'd suggested in a recent book about the fighter pilot, from the Great War to today—that he has always possessed a streak of blazing recklessness. He must be able to turn this insanity on and off as needed, as if it were electricity. By selection and attrition, youngsters of 1914 who got through training, joined combat squadrons and wracked up victories had to be, well, a bit strange.

Strange, indeed, was the name of one early bird—Louis Strange of Britain's Royal Flying Corps. Driven by fierce patriotism, he flew to France in August 1914 with a Lewis machine gun lashed on his feeble Farman two-seater. With it, he tried to attack the first enemy he saw but found his crate was too overloaded to climb higher than 3,500 feet. The Germans, going about their business at 5,000 feet, were apparently unaware of Strange as his gunner angrily sprayed the sky with bullets.

There's a Lewis gun displayed in the new exhibit, a deadly little thing with a fat drum of cartridges clipped on its breech. Unless a pilot was a very good shot, he'd have to replace the drum with another while in the throes of combat.

Flying a plane with a Lewis mounted on its upper wing, Strange got into a dogfight, emptied his drum and stood up to change it. The drum was stuck. The plane went out of control, stalled, spun and threw him out. Parachute? Forget it! Strange hung on to the jammed drum for dear life until he could get his flailing legs back into the cockpit. He made it, regained control and flew back to his base.

Even in a British squadron rich with Strange-like characters, Albert Ball was considered eccentric. Still a teenager when he joined up, Ball wrote callow letters home, enthusing about "having

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too much luck for a boy." But he earned the respect of his squadron and was forgiven for playing a violin at night, cultivating a garden and endlessly reciting Kipling. This snub-nosed schoolboy flew without a helmet because he liked to feel the wind in his hair, and munched pieces of cake while he ran his score up to 44 before he was killed. As he once wrote, "Oh la,la. Topping, isn't it?"

The Spad at the exhibit wears American markings, for many Yanks flew these when they entered the Great War. But the French flew them too, and I think of poor, frail Georges Guynemer, who had to beg his way into the military after several rejections. He flew his Spad with obsession, dark eyes glazed with purpose, fragile, tubercular body tensed for sudden death. He'd pick out his prey like a stalking leopard, then stick to it grimly, anticipating his enemy's frantic twists and writhes, firing tentatively at first, then, when the time came, with a brutal finality.

Highly decorated, Guynemer sought only a plain wooden cross. He wrote his sister that "there were . . . ninety-five out of a hundred chances for the wooden cross." He downed 53 enemy planes before September 11, 1917, when at last he found death—but no wooden cross. His body was never recovered, and French schoolchildren said that Georges flew too high to return to Earth, that he was still up there.

Sometimes sick, sometimes manic, those first fighter pilots faced a depth of fatigue that would have been unthinkable today. They say that Manfred von Richthofen, the Red Baron, was desperately tired on the April Sunday in 1918 when he was killed. Richthofen had become an aerial hunter, addicted to tracking down and slaying his victims. But the man who taught him—one of history's finest pilots—disliked killing.

Handsome, athletic Oswald Boelcke used to fly an earlier version of the Albatros that gleams on display in this exhibit. He was ever the teacher and humanitarian. In an occupied town, he once saved a French boy who fell into a canal. A fine swimmer, Boelcke dove in, hauled the lad out and berated him for not learning to swim. Grateful villagers proposed a medal, but France wasn't about to reward a *sale Boche* in 1915.

Yet the great German is remembered for his dicta, his teachings to young pilots. Other nations picked up his techniques, and in 1942, when thousands of Americans trained to fight in the air, they learned what Boelcke had taught.

Ball, Boelcke, Bishop, Fonck, Garros, Guynemer, Immelmann, Mannock, McCudden, Navarre, Nungesser, Richthofen, Strange, Udet, and the Americans—Lufbery, Luke and Rickenbacker. So the long roster of notable—and often oddball—fliers rolls on, recalled here through the implements and machines they used.

In the gallery, a huge Voisin bomber hangs overhead, stretching its wings nearly 60 feet across the ceiling like a great cloud of canvas and sticks. It reminds us that, by 1918, a few bombing attacks on cities hinted at things to come. These relatively puny raids foretold the London blitz of 1940, Hiroshima, even the Cold War and the current drive toward disarmament.

The image of war in the air has guided the destiny of nations. That's why this display of its dim and awkward beginnings fascinates. The new exhibition is permanent. And our long wait for it was indeed worthwhile.

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Phenomena, comment and notes

Fascinated by the denizens of the deep, a scientist pilots Alvin *to beyond where daylight penetrates*

I was 29 when I first looked over the rim of the Grand Canyon. Though my visit to the great hole was brief, the experience marked me, settled into my being. It became, I am certain, a subconscious part of what defines me and the way that I look at the world. Don't get me wrong. I don't mean to say it was some sort of religious experience that changed my life. But it did add a dimension to my sense of the natural world that had been missing.

The aurora borealis was like that, too. I recall being a free spirit, exploring the autumnal woods of northern Maine with my backpack and dog, where I chanced upon a fortnight's display of lights dancing through the midnight sky. I was mesmerized. And I wondered at my naiveté; how could I have lived so long in ignorance of the aurora? It is a fundamental. Like the canyon, the aurora is so magnificent, so awesome, that it seems to be a part of the very soul of nature, an elusive soul that defies description and is not to be captured in any image.

There is another place, a vast expanse of places, really, that rivals the grandeur and mystery of a Grand Canyon or an aurora borealis. But you can't go there and see for yourself. I've been, though. I go all the time. To the bottom of the sea, to the "octopus's garden."

I was drawn to the seafloor by science, securing my doctorate from MIT by studying the ecology of some of its more exotic and interesting denizens. But the deep sea is a compelling place, and being a passenger on an occasional dive to the seafloor didn't satisfy. So I became one of three pilots of *Alvin*, the premier deep-diving research submersible in the world. For much of the year, I take two other scientists down in *Alvin* every three days to explore and experiment on the seafloor.

Getting there is a study in understatement. Though the technological feat seems akin to sending a man into orbit around Earth, this three-man submersible, operated by the Woods Hole Oceanographic Institution, dives up to two miles below the surface of the sea, day in and day out, following a routine that is stunningly anticlimactic. There is no countdown, no army of personnel to supervise the launch or recovery. Even the audience of curious scientists diminishes to naught after they have watched one or two launches; thereafter, they gather to watch only when the seas have built to a height they think might challenge the skills of the operators. The submersible's and ship's crews pride themselves on making the whole operation seem effortless. Though seemingly casual, the operations are highly choreographed yet responsive, with flexibility born of the legacy of maritime improvisation.

There is no real boundary to the part of the planet I think of as the deep sea. Technically, it is defined as oceanic depths greater than several hundred feet. In my mind, the deep sea encompasses the depths of the open ocean beyond where daylight penetrates. Beyond where the sun at noon becomes twilight, beyond darkness, into utter black.

It is a silent world. I have set the submersible on the seabed and shut down all of the systems. We call it "going dead boat." Silence and darkness are immediate and ultimate, surrounding and pervasive. I feel the silence more than hear it; it feels cold, oppressive, alien. My voice in the silence sounds thin and nervous, insignificant. Never am I more conscious of the tons of water that overlie me. Only when I return power to the boat does my pulse return to normal.

You have heard that the seafloor is a desert, a vast and uniform wasteland, all but devoid of life. Textbooks on the shelf in my laboratory say so. But I know it is not true. Life on the seafloor is often unusual and diverse, more the stuff of science fiction; life is occasionally abundant, sometimes spectacularly so. Granted, in many places the diversity and wealth of life are only to be appreciated through a microscope, and by painstaking identification of the plethora of small worms and mollusks and crustaceans captured in the soft muds and cores from the abyssal plains. Prof. Fred Grassle of Rutgers University, guru of deep-sea diversity, figures that the variety of life per acre of abyssal seafloor can vie with the richness of life forms in an equal amount of tropical rain forest.

As on land, local topography plays an important role in affecting the distribution of organisms. Exploring the summits of submarine mountains, I have encountered inverse "timberlines": the peaks, but not the slopes, are populated by stands of shrublike corals. The coral polyps feed passively on bits of organic material suspended in the water: only at the peaks is the current fast enough to supply food that sustains the corals.

In other places, controls on the distribution of animals are less obvious. We have worked the submarine basins off the coast of California. On the soft mud bottom of the San Nicholas Basin, red shrimp, jumbo-sized, are the most abundant and ubiquitous of the larger animals. When strong winds forced us to move our dive operation north and east a few miles to the lee of Santa Cruz Island, we dove in the Santa Cruz Basin. There, elegant sea pens populate the mud bottom, their fleshy bodies creamy yellow, their plumes white and frilly. They are everywhere, a meadow of sea pens, all oriented into the current, ready to snatch small bits of life and debris passing by in the sluggish bottom current. Their spacing is regular, a telltale mark that the flowfield around each one defines the optimum spacing of neighbors. Why do two adjacent basins support such contrasting life forms?

There are other wonders. I have encountered herds of sea cucumbers. Picture your garden bed of cucumbers, a very large patch of them, a bumper crop. Take away the vines and expose the cukes, all lined up in one direction. This gets close to what I saw. Of course, deep-sea cucumbers are not vegetable, but animal; they are related to sea stars, though not as esthetically appealing. As I drove over the herd with the submersible, they rolled out of the way like tumbleweed before the wind. That's because they are nearly neutrally buoyant, made up almost entirely of water. I could

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actually see through them, except for the long bands of white muscle that run the length of their bodies. I don't know why they aggregate as they do, though food or sex are two likely explanations. How fast they move across the seafloor, how long they stay together as a group, what effect they have on the sediment and the animals living in it are all unknowns.

The seafloor is rich in visual textures. Where the ocean crust is young, lava flows dominate the landscape. The lavas pool and ripple and swirl in frozen motion; pillows of lava with elephant-hide skins drape the slopes of submarine mountains like icing run down the side of a cake. Stilled lavas are torn, ripped apart, prelude to and aftermath of the violent birth of new seafloor. I have driven into fissures cut deep into lavas, deep beyond seeing, and followed them until their steep-sided walls began to close in on either side. Exposed in the cuts are the histories of eruptions, flows built upon flows. Each flow shows as a discrete unit, the events and the passage of time marked by layered differences in form and color. Elsewhere, emptied ponds of lava with walls marked by "bathtub rings" are features common in the central valleys of submarine mountain ranges, but they are not found in any terrestrial environment. They are presumed to be lithic signatures of repeated filling and drainback of lava.

The lavas—their distribution and form and composition and age—provide clues to the dynamics and mechanisms of the geological processes that create the seafloor. They are the cache that geologists seek and must be carefully plucked from the seafloor. Sometimes the lavas are hard and dense, broken but in place and easy to pick up with the submersible's manipulator. Other times the lavas are intractable and must be left attached to the planet. More often, the lavas are glassy and brittle, easily shattered as the manipulator's jaws close upon them. Then I have to call on experience and patience to secure a sample for science.

Once *Alvin* is back on the ship's deck, I always go to the basket to touch the rocks I've collected, to match my tactile sense with my visual image of a rock type. Rocks brought to the surface don't look so extraordinary; in fact, to an untrained eye they look pretty much alike. But each is labeled and catalogued, chipped, cut and powdered, assayed and probed. Once the rocks are grouped into mineralogical classes, the scientists can begin to decipher the sequence of events that led to their formation.

Animals retrieved from the seafloor attract the most attention on the ship. I have seen knots of sea spiders come back alive and squirming in the bottom of the collection box; I have reached for slimy sea anemones that slipped out of my hand like soap; I have felt sorry for the ugly fish, all wrinkled and squinty-eyed. Each one is carried off to the laboratory for observation, description and experimentation. A single animal may be dissected down to organs and tissues, which are then parceled out like gold dust to waiting biologists.

From rocks and animals and water gathered by submersibles like *Alvin*, we have learned a lot about the deep sea, but we guess about a lot more. There are still entire oceans where a deep-diving submersible has never been; I hope someday to go there myself.

Cindy Lee Van Dover

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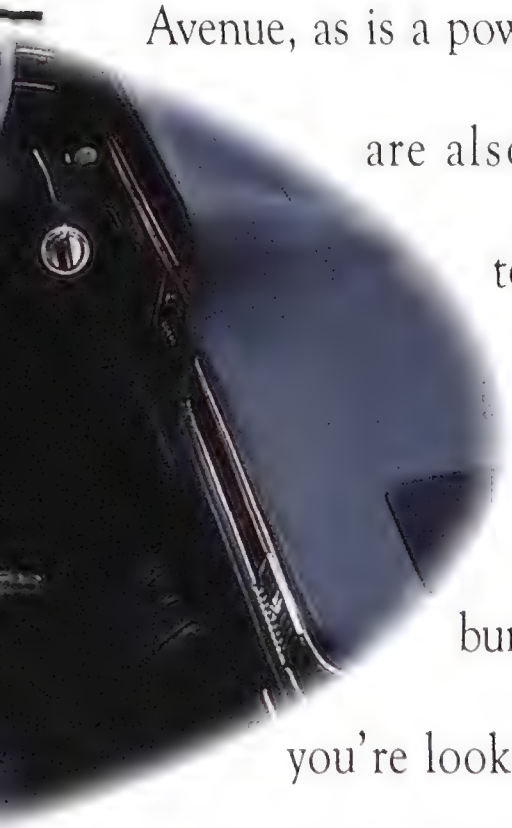

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By Timothy Foote

Where Columbus Was Coming From

Violent Europe (circa 1492) had much art and some science, but was decidedly not a place of gentleness or environmentalism

There they all are, just as they were in the dingy engravings of our schoolbooks. The welcoming aborigines clad mainly in innocence. The handful of Spaniards with swords, their heads scrunched into pointy helmets. The Great Discoverer himself, roasting in dark doublet and hose, usually on his knees in the sand, head raised to heaven. And beside them the shape of a great cross which, in perspective, looms higher than the distant masts of the three delicate little ships offshore.

For Americans it was a familiar enough image, long before all the heavy buildup to the 500th anniversary set in. Columbus, we knew, never put foot or keel on the continent of North America. He claimed what he called "the Indies" not for any collection of future Protestants from Northern Europe but for Catholic Spain in the 15th century. But we were happy to see the man as a hero and the moment on the beach in 1492 as the start of something that eventually produced the best hope yet for liberty and self-government.

Traditional views of landing feature underdressed natives, overdressed Spaniards and prominent cross.

The landing led to much else, of course. A recent cartoon, for instance, shows passengers on an antique vessel admiring a vast and rolling landscape. "I came here seeking religious freedom," one says, "but now I think maybe I'll go into real estate." Just lately the landing has also stirred liberal doses of quincentennial surprise and outrage both at Columbus (he was, it appears, a boastful slave trader with little concern for the environment) and at the cruel exploitation following his arrival, as Spanish adventurers claimed the land and enslaved many of its people.

Even in the long context of history, some shock is in order. If we are surprised, though, it may be because, apart from a Borgia orgy or two, we tend to think of the period that launched Columbus to the New World as a golden age. Bold thrusts across uncharted seas. Forays back in time to revive the lost learning of Rome and Greece. And that sunburst of artistic genius never since equaled. In *Everything You Always Wanted To Know About Sex (But Were Afraid To Ask)*, Woody Allen urges a girl to hurry up and make love because "before you know it, the Renaissance will be here and we'll all be painting."

Showtime for humanism; in short, the end of the Middle Ages and the dawn of Western science; the dazzling moment when modern man was born.

Modern man was a long way off, though, and human nature, then as now, was notoriously unreliable. Despite all the splendid expenditure of intellectual energy and egg tempera, Western Europe from 1450 to 1506, roughly Columbus' lifetime, was a time breathtakingly different from ours. Among other things, and this we tend to forget, it was a time when men believed so deeply that the body is but a sleeve of flesh containing an immortal soul, that in good faith they could see other men tortured to save their souls. It was a time so precarious that any rise in population was taken as a sign of prosperity. It was also a time

Sumptuous glorification of triumphal return in 1493 shows Columbus kneeling to Ferdinand and Isabella, bringing riches of the New World, including (left) highly romanticized native-American men and women.

much given to terror, war, pestilence, famine, slavery and religious persecution, most emphatically *not* one to encourage gentleness or ecological concern.

During Columbus' lifetime, his eventual sponsors, Ferdinand and Isabella, united the kingdoms of Aragon (his) and Castile (hers), and with startling religious and secular ferocity turned Spain, with a population of under ten million, into a nation. The great event of the year 1492 was not Columbus' sailing but their victory in Granada, bringing back to Spain the last portion of Spanish soil in Moorish hands. That same year the Spanish Inquisition issued an ultimatum to all Spanish Jews: convert to Christianity or quit the country in four months. A major exodus to North Africa occurred in August 1492, the very month when the *Niña*, the *Pinta* and the *Santa María* hoisted sail and headed west into the stream of history.

The long boot of Italy, where the Renaissance was born, consisted of five principal parts: the kingdom of Naples, the republic of Florence (richly dominated by the Medicis), the dukedom of Milan, the Papal States, which waxed and waned according to churchly ambition, and Venice. Only Venice was a great power, a sprawling city-state that stretched for miles westward and north from the Adriatic. The parts of Italy were constantly fighting with one another, and later being fought over by Spain and France in combinations and alliances that shifted, sometimes from month to month, making carnage fairly constant. "And all this time," Swiss historian Jacob Burckhardt wrote of the end of the 15th century and after, "the monarchs of the West year by year became more and more accustomed to a colossal political card game in which the stakes were this or that province of Italy."

Other Italian cities, nominally republics, had given themselves into the hands of despots, benevolent and otherwise, to insure a defense against roving bands of soldiers, and to maintain some kind of order within their gates. Venice alone remained a real republic, run by an austere and farsighted oligarchy, with overseas possessions like the island of Cyprus. The city served as a trading center for the Mediterranean world, as far as the Black Sea, and her fleet was a bulwark against the encroaching Ottoman Turks. Venice was renowned for her courtesans. She had a retirement fund and a pension system for domestic servants. She created the world's most skilled diplomatic corps. Her espionage service, like that of Israel today, was the envy of the world. "It can find out what the fish are doing and also about the fleet which Spain is preparing in her ports," one sultan wrote an agent in Seville.

In 1453, when Columbus was not yet 2 years old, the armies of the Ottoman sultan, Muhammad II, sent a shudder through Venice and all Christendom by tak-

Timothy Foote, a member of SMITHSONIAN*'s Board of Editors, is the author of a book about the Flemish painter Pieter Bruegel and the Northern Renaissance.*

Venice (left) was a world power in 1400s, famed for trade, diplomacy and learned courtesans (above).

In 1492 the heart of Venice—St. Mark's Square and the Ducal Palace—looked much as it does today.

ing Constantinople, center of the Eastern Orthodox Church and Byzantine Empire. In those days, if a city resisted, it was official policy, often not followed, to kill the men and sell the women and children into slavery. They killed Emperor Constantine in battle and converted the basilica of Santa Sophia into a mosque. Two years later they took Athens and converted the Acropolis into a mosque. The threat from Islam did not end until 1683, outside the gates of Vienna.

Like the city-states of Italy, the courts of 15th-century Europe, famous for splendor and squalor, were more medieval than modern. Think of nobles and ladies arrayed in gorgeous, particolored costumes that trailed in the mud, or swept among the rushes on the floor of the great hall where bones and leavings were gnawed by dogs. Baths were rare by modern standards, perfume prevalent. You brought your own knife to table, used it to cut off what you would eat, which was deposited on a slab of hardtack bread, known as a trencher. Whence the expression "a good trencherman." Basically you ate with your hands. (Even in the 16th century people ate with their hands. The great essayist Michel de Montaigne noted glumly that in his haste at meals he sometimes bit his fingers.)

There were new codes of manners (don't scratch yourself or pick your teeth at table) and how-to books (how to give a joust). Melees—mock war between mounted knights—caused so many injuries that the practice would soon be phased out. War never went out of style, but it was changing with the advent of guns and explosives. Meanwhile, one measure of how wide a road had to be was the length of a knight's lance if he rode with it sideways across his saddle.

Kingdoms were becoming nation-states or absolute monarchies, enlisting or extorting financial help from rich cities and merchants, raising forces to make war on rival countries and also to strengthen the crown by putting down brigandage and local disorders. The cumulative effect of violence on the common people, who suffered most from war, can hardly be imagined. Much of the fighting was done by groups of undisciplined men who fought for hire or for booty. In Italy

In 15th-century France, banqueters used their own knives in helping themselves to rich viands. As plates they usually used trenchers made of hard bread or wood. To spit or scratch yourself at table was frowned upon.

they were led by *condottieri*, freelance commanders who also were pretty much a law unto themselves. One of the most feared, Bartolomeo Colleoni, still throws a chill into tourists who run across his grim likeness, a huge equestrian statue by Verrocchio that stands in a piazza in Venice.

If passing troops did not rape and burn and pillage, they lived off the land, stripping it so thoroughly that military commanders understood an army could never retreat along the same path it had advanced over. People huddled together, praying to be passed by, or ran for the nearest walled town. As guns and explosives were perfected, even walled towns were no guarantee of safety. And when the fighting eased off, bands of ex-soldiers roamed the countryside, robbing and killing, sometimes taking possession of whole towns.

Even so, it was a time of trade and pilgrimages to holy sites with saints' relics, and if a careful count could show that some saints must have had two heads and four arms, few of the faithful complained. In peace or war you tried not to travel except in a large group, and it was unwise to talk too openly about what route you planned to take. Even in the city no one went out at night. At dark all doors were locked and double-barred. Tallow candles cost a lot and smelled, so people slept from dark till dawn. City gates were locked at nightfall. If a tired traveler arrived a minute or so too late, he was out of luck—and in danger—until morning, unless he could find a spot in one of the inns that grew up outside the city walls.

Violence and the threat of violence bred terror. Punishments were terrible, yet people eagerly flocked to see them. Few ages, except our own—and we screen it through the medium of film—had more morbid fascination with torment, killing and death, or more art and action to satisfy it. A patron saint of those who suffered from the Black Death (SMITHSONIAN, February 1990), which had killed off a third of Europe's population the century before, was the martyred Sebastian, painted again and again and again as a fleshly pincushion shot full of arrows. Skeleton-filled woodcuts were plentiful, variously depicting the Triumph of Death, the Dance of Death or the Art of Dying.

If executioners wanted to be especially humane, they strangled a man before hanging or burning him. Such leniency did not always please the crowd. Records show that spectators would sometimes buy a thief who was to be quickly executed and arrange to see him being drawn and quartered instead. Flaying and burial alive, head down, were also used. Cruelty permeated many pastimes. Bear baiting, dog fighting and the worrying of badgers were common. In the Low Countries, crowds at fairs enjoyed watching blind men with clubs being penned up in a small enclosure and coerced into trying to beat each other's brains out.

Religion and art, culture and learning, all profoundly intermingled, produced profoundly shocking and contrary effects. Pure, radiant faith and raw repression, philosophy and savage propaganda, incipient science and ingrained superstition. We know best and love most the art and architecture: timeless, stately piety (and geometric glimpses of Tuscan countryside) in the paintings by Piero della Francesca, who died in 1492, Leonardo Da Vinci's *Last Supper* and, as the 1500s dawned, the Michelangelo ceiling of the Sistine Chapel. Painters were more and more visibly enthralled by the visual beauty of the world, and even by ravishing pagan subjects (overlaid, of course, with Christian symbolism), like Sandro Botticelli's *The Birth of Venus.*

Whatever a painting's subject, most were painted "for the Greater Glory of God." These days, however, we rarely tend to connect the religious spirit that infuses such paintings with the tormenting faith that

helped produce figures like Torquemada, Queen Isabella's state inquisitor, or the auto-da-fé, an institution with which he tortured Spain. But they had a common source. If Christians spilled one another's blood copiously over the form of religion in the 15th century and after, it was partly because they never doubted that the world was a divine creation.

The civil war in the human heart, between the claims of this world and the next, ran right through the Renaissance. Worldliness among merchants and bankers, who gloried in activity and threw off the medieval notion that being rich was a spiritual liability, paid for civic improvements and history's greatest art boom. Worldliness in thought and inquiry led to humanism, which ultimately would threaten both the simple faith that allowed people to bear up under adversity, and the secular power of the Roman church. Worldliness and corruption among the leaders of that church all but destroyed it. (The term "nepotism" is linked to the proclivity that officially celibate popes had for favoring their "nephews"—sometimes bastard sons—for high office.) Throughout, unworldly purity within the church tried to reform it and failed, though thousands of the selfless religious took care of lepers and ran the hospitals, almshouses and orphanages.

Savonarola's "bonfire of the vanities"

Some of the early apostles of purity were gentle, like Saint Francis. Some were savage. In 1494, after the death of Lorenzo the Magnificent and the expulsion of his son Piero, the preacher-priest Savonarola took control of the city of Florence. He expanded the city's constitution to give more people the right to vote, but his main target was worldly excess, not only in the Florentine citizenry but in the papacy. He banned books and challenged the authority of the pope. At his fiery preachment, people gave up swearing for a time, and gaming. At huge public gatherings to expunge lechery and luxury, known as "bonfires of the vanities," they outdid one another in zeal, tossing into the flames rich clothes, perfumes, jewelry, wigs, toiletries, veils, dice, playing cards, musical instruments and paintings of beautiful women. After four years of this, history's most notorious pope, Alexander VI, a Borgia who had his murderous son Cesare made a cardinal at age 17, accused Savonarola of heresy and had him hanged from, and burned on, a gibbet placed on a special causeway built out into the city's main square.

We think of the Western world's first movable type and the Gutenberg Bible in 1455, and concentrate on the upbeat news of the general spread of learning through printed books—some 20 million volumes in Europe by the time Columbus sailed in 1492. Among those titles, though, was a best-seller called *The Ham-*

Laying bloody siege to outlying castles was almost a way of life for roving soldiery in some parts of Europe.

Plague, warfare and end-of-the-world preaching kept Art of Dying and Dance of Death scenes in vogue.

mer of Witches. Written by a pair of Dominican scholars and made public in 1486, with a little help from a papal bull against the heresy of witchcraft it helped set off two centuries of torturing, hanging, burning and drowning. The book describes how witches consort with the Devil and how they can be identified. It helpfully provided the formula for preparing the magic salve they rubbed on themselves so they could fly: first, feed stolen, consecrated wafers to toads; then burn the toads and mix with powder from the bones of hanged men and the blood of newborn infants.

Movable type was also used to mass-produce indulgences for remission of the penalties of sin, which a succession of popes sold pretty much like war bonds to finance ambitious projects. This was one of many outrages about to split the Christian world from within, setting off the Reformation and a train of religious wars that devastated much of Europe off and on for more than a hundred years. By 1506, the year Columbus died in Spain, bitter and forgotten, a man named John Tetzel, who had acquired a papal indulgence concession in Germany, was auctioning indulgences at mass meetings to the highest bidder, the very thing that was soon to outrage young Martin Luther.

Advances in the fields of engineering, design and science proceeded by fits and starts. More universities were founded. Arabic numerals began replacing Roman numerals in the pagination of books. Arabic and Greek learning in the fields of geometry, algebra, astronomy, geography and medicine were introduced into study. But people's notions of the Universe and of the human body remained hopelessly inaccurate. Even with the new type, word often didn't get around.

For example, the designs of Leonardo, the man who, more than any other, today symbolizes the artistic genius and omnivorous curiosity of Renaissance humanism. We know now about his practical "inventions": all those marvelous things—drawn with almost machine-shop detail—like chain links, the spinning wheel, the rope ladder, the parachute. But Leonardo kept his designs to himself, except for warlike devices, including some exploding cannonballs that he offered to Lodovico Sforza, the Duke of Milan, to get a job as Sforza's military engineer. The duke did not use them. And the rest of the more than 100 devices that prefigure the modern world of machinery were not rediscovered for centuries.

Millers were highly suspect

Cookstoves had just been invented. Three years before Columbus set out on his third voyage, in 1498, the first drydock was built in England. But machinery was rare in Renaissance Europe, and most of it dated back to the Middle Ages or before. The big piece of machinery that a country person was most likely to see in his lifetime was a water mill, a great, clanking thing whose mysteries were known only to the miller. For centuries millers were hated characters (more even than lawyers today) because farmers suspected they took more than a proper share of the grain brought to the mill for grinding. It was widely thought that returned flour was bulked out with a little fine sand. There were strict punishments. Cheating was hard to prove, though, so people went on feeling cheated. The comic cuckolding of the miller in Chaucer's *Canterbury Tales* was the equivalent of a modern anti-lawyer joke.

Quartering, in which a prisoner is pulled apart by horses, was popular punishment until the 1700s.

High school history teachers inspiringly tell us that in the inexorable march of progress, Nicolaus Copernicus, born during Columbus' lifetime, made the world understand that Earth orbited the Sun. (This theory had been explored by Arab astronomers two centuries before, but Western scholars were unaware.) Copernicus' reason was that if the Sun moved around Earth, the eccentric movements of planets and the more distant stars didn't make mathematical sense.

Copernicus was largely right. But his outrageous claim made little impression. If Earth revolved around the Sun, scoffers pointed out, it would have to be spinning pretty fast. Wouldn't birds be left behind? If you dropped a stone from a tower, wouldn't it hit the ground yards away? For more than a century, even learned folk went on believing that the Sun and the planets moved around Earth on powered belts called

Dominican preacher Savonarola was hanged and burned in the main square of Florence in 1498. He had taken over city to protest worldliness and defy the papacy but became a tyrant in the name of purity.

spheres, which resembled the rings of Saturn and were driven by the outermost sphere, known as the prime mover.

Copernicus could not prove his theory because there was no telescope for accurate study of celestial bodies. Moreover, the church set about making it heresy to say that Earth orbited the Sun. It wasn't until 1610 that Galileo perfected a telescope good enough to see the moons of Jupiter and to observe that Venus had phases like our moon, which meant that it circled the Sun, virtually proving Copernicus right. By then, however, the struggle between science and religion had hardened enough so that Galileo was forced to recant his findings.

Sometimes a great leap forward produced by the revival of ancient science was actively pursued, but with limited results, not because of church disapproval, but because the new humanist scholars had a tendency to regard any scientific observations by the ancients as sacrosanct. Example: the rediscovery of medical writings by Hippocrates, and especially by the great second-century anatomist Galen, which encouraged further study and practice.

The church had been against the dismemberment of bodies ever since the Crusades, when dying crusaders sometimes got friends to promise to boil them down or cut them up, the better to transport them home. But after his rediscovery, Galen was recognized as the father of the science of anatomy, and approvals were given, especially to celebrated physicians and painters, to dissect human cadavers.

The work was mostly done in winter and in haste (there being no refrigeration), and performed on the bodies of convicted thieves and murderers who, presumably, had less chance at bodily resurrection than virtuous folk. At such events, the exalted physician did no cutting. He stood on a high pulpit reading from

Galen, while below, the poor barber-surgeon did his best to prove that the cadaver matched Galen's description. Pictures of these scenes show crowds of students and plain rubberneckers pressing in around the corpse. Also, sometimes, a small dog waiting for any choice bits that may come his way.

Galen had used Barbary apes in his experiments, and there were some dramatic anatomical discrepancies. But since Galen could not be wrong, these were usually blamed on the ineptitude of the surgeon. Even Andreas Vesalius, one of the great anatomists of all time, born just eight years after the death of Columbus, deferred to Galen's errors. Yet he finally incurred the wrath of professors at the University of Paris because many of his findings, based on dozens of personal dissections of human bodies, disagreed with Galen's. What physicians could quote from Galen's text was, in a sense, their meal ticket in the profession; they did not want it jeopardized by anything so mere as accuracy.

A great hindrance to medicine was ignorance of physiology. Galen never understood that the heart is a muscle; he thought blood was moved back and forth, like the tide, impelled by some mysterious heavenly spirit. It was not until the 17th century that William Harvey unlocked the secrets of the circulatory system. In Columbus' time and for several hundred years after, doctors thought health and temperament were determined by the mix of the famous four humors (i.e., fluids) of the body: blood, phlegm, choler (yellow bile) and melancholy (black bile). The ideal was balance. Whatever mix you received from the gene pool determined your disposition, then known as your "complexion." A choleric man was likely to be yellow-faced, lean, proud, ambitious, shrewd and quick to anger. A sanguine man, having much blood, was likely to be cheerful and optimistic. Doctors mostly sought to change a patient's body-fluid balance, the old standbys being puking, purging and bleeding.

Clearly the early Renaissance was no time to be sick. Public faith in the medical profession had fallen because doctors had proved so helpless during the plague years, earnestly suggesting such cures as inhaling the smell of billy goats. Besides, even after its worst period of killing, the plague did not go away either, and there was still no cure and almost no prevention. As late as 1484, when the 33-year-old Columbus had just asked for backing from King John II of Portugal and been rebuffed, the plague killed 50,000 people in Milan.

Diagnosis was like blindman's buff. Indiana University professor Ann Carmichael, author of *Plague and the Poor in Renaissance Florence* and doctor of medicine turned medical historian, has been studying computerized medical and death records from 100,000 cases recorded in Florence and Milan circa 1450 and after. She notes that people did not really expect cures. Doctors were simply expected to provide some care and easing of pain.

Except for the bleeding and puking, Carmichael feels, much of the care was good. Doctors kept patients quiet, saw that wounds were cleaned and bandaged,

Rediscovered maps by 2d-century astronomer and geographer Ptolemy, whose global map on flat plane indicated a large Asian landmass, and thus a shorter distance by sea westward to Orient, helped Columbus decide to attempt the trip.

and used effective herbs and salves, many of them left over from the medically underrated Middle Ages. Though Renaissance barber-surgeons were looked down upon by lordly physicians who spouted mock science and took high fees, they could set bones and cut off legs. (To ease the pain, the patient was given things like mandrake root, henbane or opium in wine. As late as the 18th century, however, it sometimes took five people to extract a tooth—four to hold down and one to pull.) Surgery and bone setting were expensive. If you fractured a wrist or dislocated a shoulder and hadn't the means, chances were you'd get an enduring bone infection or be left to heal gradually—more or less crooked and crippled for the rest of your life.

There were no antibiotics. Pus was taken as a sign of healing (whence, until late in the 19th century, the term "laudable pus"). Babies died in the thousands of gastrointestinal diseases. Even today, Carmichael notes, in the Third World, "diarrhea can turn a baby into a prune in less than four days." In the 15th century three out of five children failed to reach age 5; fully half did not make it to age 20.

The plague had taught people some things. As a great maritime power, Venice established the quarantining of sailors off arriving ships, initially for a period of 30 days. To cut down possible sources of contagion when plague threatened, many cities banned the resale of old clothes (which were burned instead). Communal public baths were banned, too.

Florence had a city ordinance forbidding citizens to throw dead cats into the river Arno. But there, as elsewhere, people were regularly buried in city churchyards that leached into nearby streams. In some places garbage was burned or collected to be tossed over the city walls. (In Paris as late as 1512, the pile outside the walls was so high that the king had it removed because he thought invaders might climb up the garbage and scale the city's defenses.) In Italian cities piazzas were kept clean, but in the backstreets, refuse often simply lay around to be churned to a kind of black muck after rains. Farm animals living inside the cities added to the mess, but when cities, with a view to cleanliness, banned their presence inside the walls, things got worse. It turned out that city pigs had been performing a major cleanup service.

Occasionally the revival of ancient learning was swiftly absorbed, extended and applied to a real problem, changing Man's conception of the world. By far the happiest example, especially for Columbus' quincentennial year, lay in the field of sailing, after Portugal's Henry the Navigator set up a center for sharing knowledge. One notable event was the recovery of *Geography*, a treatise written by Claudius Ptolemy in the second century A.D. and lost to Western Europe for hundreds of years.

In the 1400s, a European man in the street may possibly have figured the world was flat. But church scholars, as well as other learned men, had long regarded it as a globe. Nevertheless, they thought that its lower half was uninhabitable except for weird crea-

Among the imagined denizens of unknown nether half of the globe were a headless (but not faceless) man, and topsy-turvy "bigfoot" using his extremity as a parasol. Columbus read books filled with such monsters before voyage.

In anatomy class, physician (top) read from revered text by Galen, while surgeon tried to prove text right.

tures, such as giants with a single huge foot. Around the Equator lay a "torrid zone," where the sea was boiling hot. For purposes of spiritual orientation, on most "world maps" of the time, Jerusalem was presented as the center of the world. On others, more realistic in intent, only the Mediterranean, Europe, the Middle East and the top part of the bulge of Africa had any detail. The Indian Ocean was a vague inland sea. The nether regions of the globe were as firmly closed as outer space to the questing imagination.

Ptolemy's *Geography*, printed up in book form in the late 1470s, helped change all that because it used information garnered from longtime Islamic experience, as well as from the far-flung records of the Roman Empire and the conquests of Alexander the Great. Ptolemy's maps projected the surface of the globe onto a flat surface, pretty much as we do today, and showed some detail about the East African coast and the Indian Ocean. Perhaps more important, Ptolemy had divided the complete circle of the globe into 360 degree units of longitude, estimating each degree as about 57 miles long at the Equator, considerably less than the 69 miles we now know to be the case.

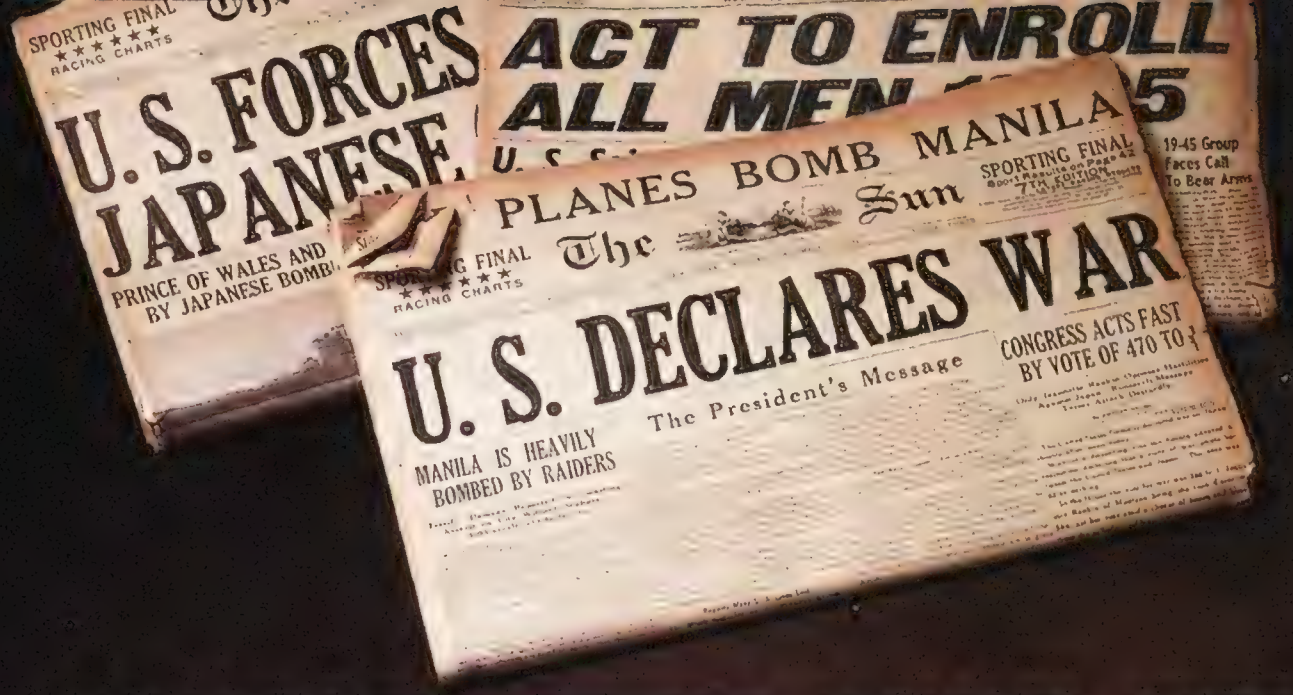
"Maps," as J. R. Hale puts it, "are diagrams of the possible." To sail anywhere, risking your life, you must at least imagine where you are going. With Ptolemy's *Geography*, and others, in hand, Portuguese sailors who had been following the coast of Africa farther and farther south could imagine sailing around the tip of Africa to India and the Spice Islands, instead of paying Arab middlemen a whopping price for dear items like pepper and cloves. In 1487 Portuguese captain Vasco da Gama did just that, dramatically expanding Europe's vision of the world.

Columbus cooked his figures

Then came Columbus. Using Ptolemy's distances, in addition to the observations of another scholar, Pierre d'Ailly, who reasoned that between Spain and the Indies there were only 135 degrees of open sea, Columbus cooked his figures to reduce the number of sea or land miles in each degree of longitude. By his reckoning, Japan lay only 2,760 miles from Spain, or roughly a quarter of what it is. Wild for financial backing, he once noted, "The end of Spain and the beginning of India are not far apart . . . and it is known that this sea is navigable in a few days' time with favoring wind." History has much derided the Spanish experts who were leary of Columbus' estimates. They were right. But Ferdinand and Isabella were right to back him anyway. By risking the equivalent of $7,200 and the use of two ships (he had to charter the third) they got title to much of the New World.

Within 30 years, trading ships were shuttling back and forth where, shortly before, hardly a man had dreamed of going. The Western Hemisphere was being explored, the Pacific had been crossed and, with Magellan's voyage of 1519 (SMITHSONIAN, April 1991), Europeans had made it around the world. All this eventually meant a flood of silver, gold, land and sugarcane profits, as Spain became the most powerful country in Europe, with a far-flung, enduring empire. It also brought an appalling expansion of slavery.

There was little in Columbus' background to make him feel glum about any of the above. He was very much a man of his time in his courage and in his faith that God wanted all this to happen, as well as in his passion for trade and his desire to exploit the physical world. His Europe was a smallish peninsula sticking out from the landmass of Asia, with much seacoast north and south reachable from inland, many harbors for shipping and rivers for waterpower and trade. Europe's way to the gold and spices of the East had been slow and expensive, since it was controlled by



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In 1543, Nicolaus Copernicus declared that Earth moves around the Sun, but no proof came until 1610.

the Arab world and lay through the Middle East, until navigators solved the problem. As historian Fernand Braudel notes, 15th-century Europe needed to expand into the New World.

Columbus needed to make his trip pay. When it turned out there wasn't much gold where he landed, he naturally turned to the enslavement of the poor people of the Indies. Hadn't Aristotle, a fount of Renaissance learning and the father of scientific classification, decreed that mankind is divided into two classes, the few (and smart) destined to be masters, the many to be properly classified as slaves?

Slavery existed everywhere—including the New World (though no one knew that yet) and Africa. The Turkish sultan's whole army and many of his administrators were his personal slaves. William Phillips, author of the recent study *Slavery from Roman Times*, draws on data showing that by 1400, Arab traders working West Africa had brought back four million slaves for the Middle East alone.

The cruelty and expansion of slavery in the New World seems more reprehensible, however, precisely because in 15th-century Europe slavery was relatively rare and getting rarer. This was partly because Christianity taught that manumission of slaves was pleasing to God, partly because peasants were more efficient than slaves in handling European agriculture.

Many families had a slave or two

Christians were not allowed to enslave other Christians, but many city families in 15th-century Europe had a domestic slave or two. Mostly young, white and female, they lived with the family and found it relatively easy to marry or work their way to freedom. They were acquired as pagans, usually in Eastern Europe or Circassia, and baptized to save their souls only after they were in service. (As early as the 12th century, the word for "slave" in Italian, German, Spanish, French and English derived from the word "Slav.")

From the start, there was anguished complaint by a few Spaniards about Spanish mistreatment of native people in New Spain—and about slavery. By 1542, with slaves being brought in from Africa, the church and the Spanish government had banned enslavement of "Indians" in the New World, but for some groups in the Caribbean it was too late. They were all but extinct.

It is the fresh awareness of such things (often overlooked in previous, upbeat histories of the period), as well as the new environmental passion, that have led to condemnations of Columbus and what followed him. The European "discovery" of the New World, as one outraged chronicler recently put it, defiled the Garden of Eden, corrupted paradise, and brought little with it but "deforestation, extermination, cruelty, destruction and despoliation."

Such a view may be forgiven, perhaps, as distorted overstatement in a virtuous cause. It is hardly necessary, though, to start a list of hard-won and useful things that eventually resulted from Europeanized thought and action after the Old World arrived in the New: trial by jury, freedom of religion, medicine to cure or prevent almost all manner of plagues, painless dental drills, attempts at universal education, the Bill of Rights and rights for women, the seeds of parliamentary democracy, hope at last for a united United Nations, not to mention the whole rich complexity of Hispanic America today.

The real foolishness of such judgments lies in the utopian delusion that there ever was a paradise here, and a hopelessly skewed perspective that seems to want us to believe that the globe has been going downhill

since the Paleolithic period when, granted, few human beings were defiling it. The New World in 1492 (SMITHSONIAN, November 1991) was sparsely populated and largely underdeveloped. But war and slavery existed. So did slashing and burning for agriculture, and imperial exploitation. And those who ceremonially split a virgin's heart each day to please their deity, or sacrificed babies for rainfall (the more tears, the more rainfall, it was thought) can hardly be seen as denizens of a Garden of Eden, free of violence and greed, wholeheartedly dedicated to benevolence and ecological harmony.

If the biblical story of the Garden of Eden has any application here, in fact, it is only as a figurative reminder that humans are not angels. They seem, instead, creatures doomed by providence or evolution to a prolonged, perhaps endless, struggle with greed, lust, violence and ignorance. Anyone who doubts it has only to glance at the daily papers.

Medieval Europeans knew this, but blamed Man's sinfulness for much that happens in the world, figuring that the issue mostly would be settled between the Devil (in those days he was "as real as a sore tooth") and the Deity. From the Renaissance on, men felt more prideful about mankind. This remarkable creation, cruel and greedy, yet capable of selflessness and heroism, located somewhere between the beasts and the angels in the great chain of being, had one unique and distinguishing skill and virtue—the compulsion and the capacity to learn and experiment—and so might yet prove able to change history for the better.

Since Charles Darwin's *Origin of Species* we've understood that it will be a slow business at best, a matter of trial and error. Little use in blaming this race or that government. In any Garden of Eden drama, Man will always be the serpent—and Adam and Eve as well. James Madison said it all at the Constitutional Convention: "If men were angels no government would be necessary." Columbus, and the land that launched him, simply helped another act begin.

Illustration for *A History of the Destruction of the Indies* by Bartholomé de las Casas shows the Spaniards rounding up people for slave trade. In 1542, thanks to las Casas, enslavement of the Indians was banned.

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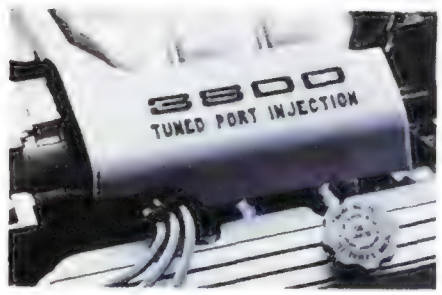

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Buckle up, America!

By Phil Patton

Sleek but square—and that's why we loved the Studie

The car embodied the excitement of flight, yet every model carried the genes of the old green wagon from which it was descended

In 1928, when the Studebaker Company hired Tony Caralla, it provided him with wheels right away: roller skates, on which he retrieved spare parts at its huge repository on 131st Street in Manhattan, sailing down the long aisles with his white lab coat flying behind him. But soon, Caralla's encyclopedic knowledge of the inventory inspired his bosses to make him chief of the Brooklyn warehouse—and they provided him with a shiny new Studebaker car to get there.

Now Caralla, two months short of his 85th birthday, wearing his original employee's brass badge and a battered Western straw hat, pauses beside a similar car, a Studebaker Erskine, made from 1927 to 1929. "This one," Caralla observes, with a connoisseur's eye, "is probably a '29, because it has full crown fenders."

The hot Missouri sun beats down on some 400 vintage Studebakers assembled with their owners for the annual gathering of the Studebaker Drivers Club, an organization 12,000 strong, dedicated to preserving one of America's oddest and most beloved automobiles. Nearly three decades after the last Studebaker was made in the United States they remain loyal. They'd rather fix, they say, than switch.

Caralla is one of the club's seven founders; its charter, he tells you as he fairly bounces among the cars, eyes alight, was signed on Christmas Eve, 1962, in the Bronx garage from which, for almost a half-century, he sold parts for Studebakers. "I never left there," Caralla says, "so the others came to me."

He is a legend among his fellow club members.

The 1950 "bullet nose," with its radical front-end styling, would become the company's all-time best-seller.

Farmers dubbed it the "two-row corn picker," while clever dealers stuck a propeller on showroom models.

Color photographs by Baron Wolman

They greet him, marvel over his knowledge, test his memory: as long as Tony remembers, Studebaker will not be forgotten. "There's probably nobody who knows more about Studebaker parts in the world," says one man as he shakes Caralla's hand. "What's the number for the upper bushings for the V-8, Tony?" "Fifteen fifty-three four-thirty," he replies without a pause.

Caralla's step is springy as he wanders among the cars: venerable 1919 Light Sixes, Roadsters and Speedsters, Commanders and Presidents, streamlined Skyways and bullet-nosed Starlights, gleaming in the sun. Low-slung 1953 "Loewy coupes," among the compact Larks and Gran Turismo Hawks and Avantis. Models painted in the various greens Studebaker has always favored—a forest green, a key-lime-pie green, a swimming pool green—or in exotic mid-'50s two-tones, lemon yellow and lime green, licorice black and strawberry pink.

Yellow-capped judges eye best-in-show entrants at this year's annual convention in Springfield, Missouri.

Studebaker buffs are almost a secret society, but once you become aware of their existence, you seem to find them everywhere. Try asking, at any sort of gathering, about Studebakers and you will hear, "Sure, I learned to drive on a Studebaker" or "My father wouldn't own any other kind of car." You will elicit fond childhood memories of leaning back and seeing clouds or city lights floating magically across the curves of the famous "Is-it-coming-or-going?" rear window of the late '40s and early '50s models, shaped like the cockpit of a DC-3. "It was a car with real personality," says one driver. "It was like owning a chunk of Radio City Music Hall." It is a truism among Studie nuts that if everyone who remembered Studebakers affectionately had bought one, the company need never have gone out of business.

The shapes were beautiful—but odd, too

What kind of cars could inspire such fervor? It was their shapes—beautiful, to be sure, but odd too, and unprecedented—that won Studebakers their fans. The lines of their bodies for once lived up to the lines of their advertising, from the "air-curve symmetry" of the 1934 model to the "Jet-streamed wonder car" of 1951.

"They were for people who wanted something different. They were designed for the future," says Arnie Behrens, who has brought his 1951 bullet-nosed Champion to the meet from Beatrice, Nebraska, and, now that his grandson Jeff has replaced a broken taillight ($10), wants to sell the car for $3,400.

Studebakers were also renowned for their toughness. "They prided themselves on strength and durability," says Texas collector John Brooks. But neither virtue alone sufficed to turn Studebaker into a legend: that transformation required the company's sudden death, in 1963. "One day it was there as it had been for more than a century, the next it was gone," says Ron Radecki, director of the Studebaker National Museum, in Studebaker's hometown of South Bend, Indiana.

Many Studebaker buffs feel that the end of Studebaker had wider implications. Car companies had gone out of business before, dozens of them, and great names: Duesenberg, Cord, Pierce-Arrow. But Studebaker was the only company to make the transition from wagon to modern car. Many Studebaker Drivers Club members believe that the decline of the American automobile industry and the Rust Belt was symbolically signaled that gray day when Studebaker closed the South Bend plant. The cars stood for quality as well as personality. "Remembered, not recalled" is one popular bumper sticker slogan among SDC members.

AS LONG AS THERE ARE PEOPLE WHO
WON'T MAKE A GOOD CHOICE WHEN IT'S
POSSIBLE TO MAKE A GREAT ONE ...

There will always be a

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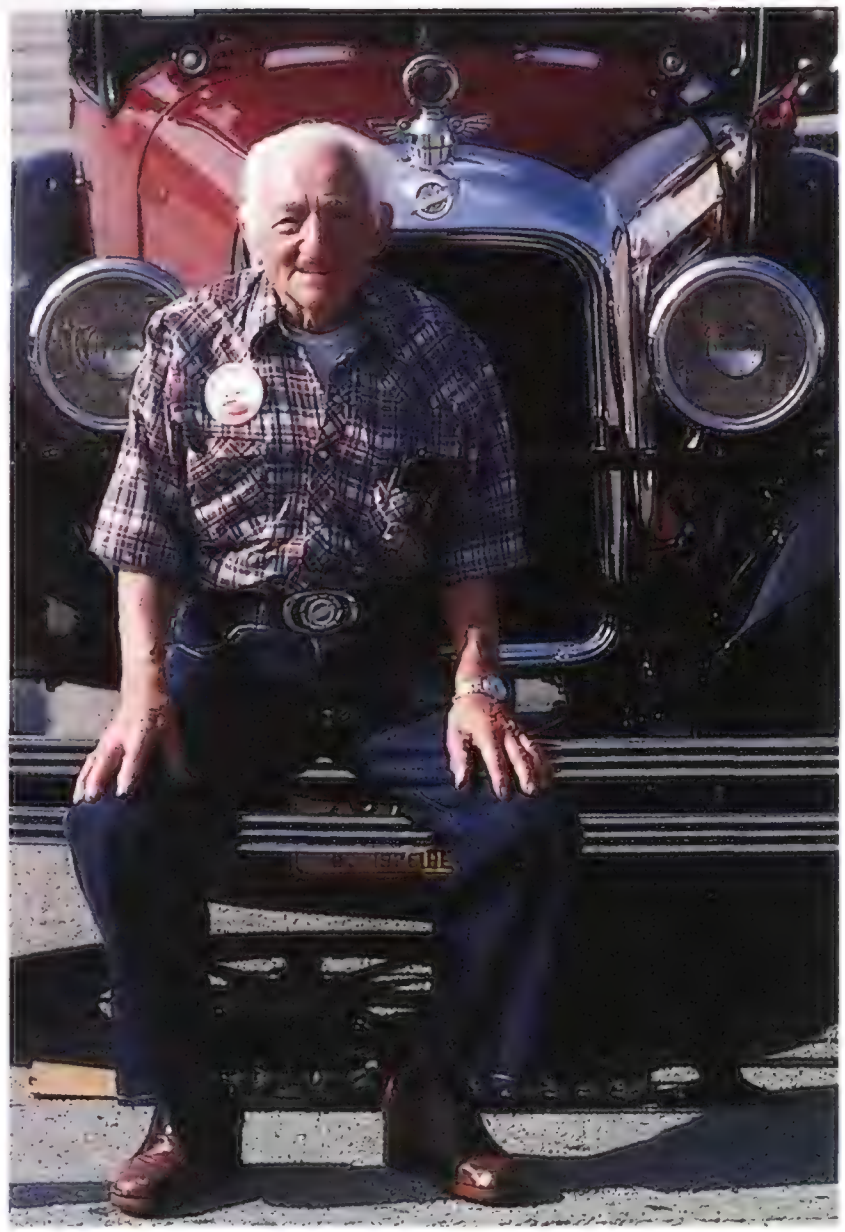
The '55 President, designed by Raymond Loewy's team, turned heads with its cool colors, low-slung profile.

It is this collective memory that draws the loyal together, leads them to avidly read *Turning Wheels*, the SDC journal, inspires them to drive and show their cars together in such colorfully named local chapters as the Northland Wheels of Minnesota, the Orange Empire chapter of southern Florida, the Conestogas of Colorado, the Blackhawks of Illinois, the Keystone of Pennsylvania, the Vegas Champions or Ozark Trails, whose members, resplendent in red vests, are the hosts of this year's national meet in Springfield, Missouri.

Only a few members are former employees like Caralla. John Brooks' parents ran the local dealership in Bay City, Texas, until his father was called away to the war effort. "I relate this to myself," he says, sitting on the cracked rubber of his 1937 Dictator's running board, "since I was born in 1937." Now Brooks owns what he modestly refers to in the official SDC Roster as "quite a few." In fact, Brooks owns more than a hundred, in states of varying repair and disrepair, virtual acres of Studebakers, the oldest a 1923 Coupe Roadster. "I'm not a person that figures there was only one thing Studebaker did that was good," he says. "I like 'em all."

Studebakers are still affordable, ranging from $800 to $8,000 for a prime model. "It's car collecting for the average man," says Ron Radecki. The favorites are models of the late '40s and early '50s, whose shapes came from the studio that industrial designer Raymond Loewy established in South Bend.

Phil Patton has just finished his book Made in USA: The Secret Histories of the Things that Made America, *due in February from Grove-Weidenfeld.*



Walking encyclopedia Tony Caralla, the man every Studie buff wants to meet, likes the '26 Standard Six.

Loewy, who created the Sears Coldspot refrigerator and the Lucky Strike cigarettes package, claimed to be able to reshape anything "from a lipstick to a locomotive." Born in France, he came to the United States in 1919, at age 26. After a career as a graphic artist and department store window designer, he established his design firm. There, Loewy quickly discovered that his greatest single talent was in persuading corporate executives of the financial wisdom of design—and specifically of hiring his firm. "He streamlines the sales curve," ran the cover line when *Time* magazine profiled him in 1949. In his prime, Loewy employed a staff of more than a hundred, in several offices. In his later years he designed logos for Shell and Exxon. He sat on the floor of the Oval Office with JFK redesigning Air Force One, and he created interiors for the Skylab space station.

Loewy criticized the "spinach and schmaltz" of Detroit cars, which he called "rolling jukeboxes"—an opinion that appealed to Studebaker executives. But so did something else: for Studebaker, Loewy, with his French origins, Eastern polish and personal flair, represented sophistication that South Bend greatly

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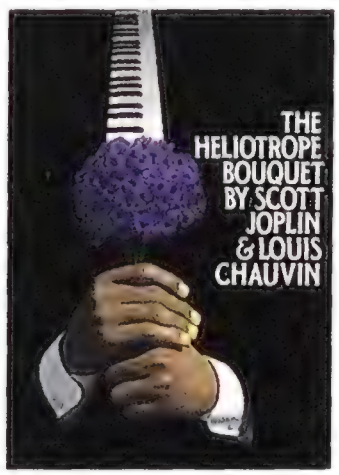

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With end of World War II, Studebaker was riding high, its dynamic shape linked to postwar optimism.

Studebaker brothers (left) came to South Bend in their father's Conestoga, then built wagons themselves.

admired. He would descend grandly from the Pennsylvania Railroad's Broadway Limited into South Bend's vaulted Union Station, then proceed to his firm's office, its sign illustrated with a futuristic car, speed lines streaming from it. There, less publicized employees did most of the real design work.

In working for Studebaker, Loewy occupied a unique position as consultant to a major auto firm. Most carmakers had their own design staffs. As an incidental result, Studebaker was exempt from an agreement among the Detroit firms not to work on passenger car development during World War II. In 1942 Loewy initiated a project that produced sketches of imagined future cars, and by 1944 he was bulking up staff in order to beat Detroit to market with a car after the war. The flat sides and flanks of the '47 go back to sketches done in 1941 by top Loewy designer Bob Bourke.

The 1947 Commanders and Champions that arrived in May of 1946 made Studebaker "first by far with a postwar car." That car looked as light and fast as a fighter plane, its front fenders integrated into the body so the front suggested speed, its windows evoking a canopy. The rear fenders surged forward in the sort of boomerang shape that was to become a popular motif of '50s design. It was one of the most influential cars in American auto history. "Through its impact on GM and Ford after 1946," wrote C. Edson Armi, historian of American auto design, "Loewy's studio fundamentally changed the direction of American cars."

As a student at the Art Center College in Pasadena in the early '50s, future Ford design head Jack Telnack—who would direct the creation of the landmark Taurus and Sable of the mid-'80s—owned a Studebaker. The influence reached back even to Europe. Bruno Sacco, today the top designer for Mercedes, recalls his first sight of a Studebaker: "It was the year 1951, late spring in Tarvisio, in the Italian Alps. I was cycling along the main street of the town. . . . Suddenly I became aware of a car coming the other way—I think it was electric blue—it was certainly something out of the ordinary . . . something that put everything else in the shade. . . . For me the Studebaker Commander 1950 Regal De Luxe Starlight Coupe . . . was the be-all-and-end-all of automobiles. . . ."

But under what the ads called "dreamline curves," there was another and contradictory side to Studebaker: the legacy of the Midwestern company that had produced wagons for half a century before it turned out its first automobile. Inside each car was a bit of wagon. And beneath the curves, there was always something a little, well, square. Studebakers were different from Detroit cars because they were made in South

Model in this ad, a 1947 Champion, was given by parents to George Bush as he set out on his career.

Raymond Loewy (seated) put together a design team that included Bob Bourke, creator of the 1953 coupe.

Bend, a town that embraced Middle American values with the intensity shared only by recent immigrants.

They were made by good solid Middle American folk—folk cut off not only from Detroit trends, but also from much of the impact of events in the rest of the world. Not until 1938, for instance, did folks in South Bend see enough of a problem with calling a car the "Dictator" to drop the name.

"Studebaker quality goes back to . . . vigorous, healthy, fruitful roots," claimed a 1939 ad. The company emphasized its multiple generations of workers and family ties. A succession of immigrant waves—Germans, like the Studebakers themselves, Irish, Poles, Hungarians—came to the factory, producing a group as ethnically mixed as the bomber crew in a World War II film. And sons tended to follow fathers into Studebaker's factories. A 1939 ad described families of workers named Bukowski, Lundquist and Kerezste.

This ethos produced an attitude toward and by labor that was unusual in the automotive world. South Bend's UAW Local 5 was the only local with a contract based on piecework. Studebaker had the most highly paid, but also perhaps the most experienced and highly skilled, work force in the automobile industry.

These solid virtues were complemented by solid engineering and, when the company was still in its prime, a number of technical innovations. Studebaker engineers were men like Delmar (Barney) Roos, one of the unknown heroes of American technology. A veteran of Locomobile, Marmon and Pierce-Arrow, where he was chief engineer, Roos came to Studebaker in the '30s and developed a new type of suspension, called "planar," marketed in 1935 as "Miracle Ride."

The bit of wagon in every Studebaker car carried genes of the first model, sold in 1852 for $18 to a farmer named Earl. The five brothers Studebaker had arrived in South Bend in their father's Conestoga wagon—which is still preserved in the museum. The youngest brother, John Mohler Studebaker, went on to California, his head full of visions of gold—soon dispersed by the insight that making wheelbarrows for the men looking for gold was a sounder proposition than looking for gold himself. When he returned to South Bend in 1858, "Wheelbarrow Johnny" was prosperous enough to invest $8,000 in his brothers' company. With the coming of the Civil War, and contracts to make wagons for the Union Army, their fortune was made.

In an informal contract, they resolved to expand even further: "I, Peter Studebaker, agree to sell all the wagons my brother Clem can make. [Signed] Peter Studebaker." "I agree to make all he can sell. [Signed] Clem Studebaker."

The Studebaker: sleek but square

A '35 Dictator roadster: three years later the company dropped the name, realizing there was a problem.

Soon the characteristic green of the company's wagons, the name "Studebaker" painted on the side in forthright black letters shadowed in gold, and the wagon wheel trademark were recognized as symbols of excellence. The company established a repository in St. Joseph, Missouri, the jumping-off spot for settlers heading West. By 1879 Studebaker was selling a million dollars' worth of wagons and carriages and billing itself as "the largest vehicle house in the world."

It prided itself on such technical innovations as the "slope-shouldered spoke." Most common was its basic buggy, the "izzer," so called after a grumbling farmer derided another maker's buggy as a has-been, a "wuzzer." The famous 20-mule teams that hauled borax from Death Valley pulled Studebaker wagons. From driving a Studebaker buggy as a ne'er-do-well Ohio shopkeeper, Ulysses S. Grant went to commanding an army whose supplies moved in Studebaker wagons—and arriving at the White House in a Studebaker carriage. Studebakers were sold around the world. The young war correspondent Winston Churchill was riding in one in South Africa when captured by the Boers.

But something new was on the horizon, and Studebaker did not miss it. Thomas Edison paid a visit to South Bend: in 1902 Studebaker produced its first electric car. In July 1904 its first gasoline-fueled car, a 16-horsepower two-cylinder, paraded through South Bend to the strains of "There'll Be a Hot Time in the Old Town Tonight." By 1913 Studebaker was the nation's third-largest producer of automobiles.

In 1919, Albert Erskine, the first nonfamily head of the company, assumed its presidency with high ambitions: he wanted to make Studebaker as diverse and powerful as General Motors and as successful as Ford. Erskine bought a luxury carmaker, Pierce-Arrow, as GM had bought Cadillac, and introduced a lower-priced car, which he, like Henry Ford, modestly named for himself—the Erskine, the model given to Tony Caralla.

Thanks in part to aerodynamic design, the Avanti was among world's fastest mass-produced cars—168 mph.

The '20s were good to Studebaker. Raccoon-coated sheiks and bob-haired flappers sped off in Studie speedsters. Al Jolson, Mae West and the Little Rascals mugged beside the cars. Studebakers also raced. "From the Speedway comes their Stamina, from the Skyway comes their Style," ran a '30s slogan.

Then came the Depression. Trying to produce a

The owner of this 1946 pickup spent $7,000 fixing it up after finding it colonized by mice in a barn.

By the late '50s, Studebakers were being embellished with chrome geegaws, such as turn signal on this Hawk.

lower-priced car, Studebaker unveiled a new model called the Rockne, after the Notre Dame football coach. But Knute Rockne died in a plane crash before his namesake car even appeared. Still, Erskine clung to his dreams. To keep the stock price up, he continued paying dividends. Since the slump in sales meant there were no profits, these came from capital: the company was eating the seed corn. By 1933 it was $6 million in debt. On March 18, Studebaker went into receivership.

On July 1, Albert Erskine, the man who once crowed that he "ate obstacles for breakfast," wrote a note to his son, wrapped a towel around his revolver, placed it against his heart and pulled the trigger.

Not long afterward, Tony Caralla, who had watched his salary shrink along with the company's bottom line, left to open his own Studebaker parts business, garage and 24-hour gas station in The Bronx. He would be there for nearly 50 years.

But somehow Studebaker survived. It was the only car company of the many that entered bankruptcy in the Depression to emerge from it. In 1935 new bosses Harold Vance and Paul Hoffman negotiated fresh capital; both men had worked their way up in the firm. Hoffman was a successful salesman who won an essay contest on the theme "How to Sell a Studebaker." His prize was an interview with the ancient Wheelbarrow Johnny, who imparted his proverbial advice: "Always give the customer more than you promise—but not much more, or you'll go broke."

In 1936, Hoffman and Vance hired Loewy to apply lines from the "Skyway" to their cars. For 1939 he produced a winner: the low-priced Champion, star of the company's dramatic display at the 1939 World's Fair, where Judy Garland endorsed it. Sales jumped from $43 million to $81 million.

World War II pulled Studebaker, like the rest of the country, fully out of the Depression. It built Weasels (tracked vehicles) and thousands of trucks, mostly for lend-lease. They were so durable that "Studebaker" entered the Russian language as a synonym for "indestructible vehicle." Some of these, legend has it, are still operating in Siberia. In 1945 the company was so prosperous that federal officials contemplating the wreckage of mismanaged Ford considered putting it under Studebaker's stewardship.

Purple-prosed—but popular—ad copy

Then came the postwar automobile, with its aerodynamic lines, paucity of chrome and sleekness of body, lending it the efficient air of a swift military command car. For once the public agreed with the ads, which boasted, in language as exuberant as the styling, of a car with "low-swung dreamlines so supercharged with eye appeal it almost seems to swagger as it wheels up."

The car summed up postwar optimism, all the energy of the war effort now brought home, as the dynamic shapes of fighter planes had been incorporated by Loewy's designers in the family car. Who bought these cars? The traditional Studebaker buyers were farmers and workers, but although Studebaker was never much on market research, it is clear that there was a new group of buyers for the '47: better-educated people, Easterners who might, in a few years, graduate

The 1953 coupe, Bob Bourke's masterpiece, was introduced at the Waldorf-Astoria in New York and made the cover of *Time*. In automotive circles, it is considered to be the finest Studebaker.

to funny European cars: Volkswagens, Peugeots, Saabs and Volvos. When the Brooklyn Dodgers won the pennant in 1947, Branch Rickey bought each of the players a new Studebaker. And in 1948, when a young naval veteran graduated from Yale and set off to seek his fortune in Texas, his parents bought him a new red Studebaker for the trip. Their name was Bush.

When most people think of a Studebaker it is of the bullet nose, the '50 and '51 models the front of which looked so much like an airplane that some whimsical dealers put on a prop. "They're low! They're long! They're luxurious!" trumpeted the ads—and the bullet nose gave the company its best year in 1950, when it sold 343,000 cars, earned $22.5 million in profits and held 4.2 percent of the market.

But in automotive circles, it was the 1953 coupe, the masterpiece of Bob Bourke, from whose drawing board it began as a show car, that has become most appreciated. Long and low, swooping back so that it seemed fast even when at rest, the car was unmistakably elegant. Introduced at the Grand Ballroom of the Waldorf-Astoria hotel (above), it was featured on the cover of *Time*. The Museum of Modern Art put it on display. Michael Lamm, respected auto writer, has called it the loveliest of all American cars.

But what Studebaker called it was a sports car, not the thing to appeal to the hardworking sorts who still remembered its wagons. While an esthetic triumph, the move to avowedly "European" styling, complete with ads showing the new Commander with the Eiffel Tower in the background, may have been a marketing mistake. The '53 did not seem like a car for, say, Mark Garber, the Pennsylvania farmer featured in an ad for the '47 model, who testified that he carried produce to market in his Champion. The reviews were great; sales were merely solid. The company sold only about 25,000 more cars than the year before.

Part of the problem was that Ford and GM had begun a price war that hurt Studebaker and other smaller firms badly. The company began to alternate desperate and expedient reuse of older technology with wild experiments. Still Studebaker's market share and profits fell. In 1954 it merged with another once great, now ailing firm, Packard. Studebaker lost its nerve in styling and gaudied up its cars with chrome and fins in a halfhearted attempt to compete with Detroit. Loewy was fired in 1955.

In 1959 hope briefly revived: the compact Lark brought the company one boom year and $28 million in profits. The next year, however, Detroit's Big Three came out with their own compacts, and Studebaker's sales slumped again. Studebaker had one last hurrah—and so did Raymond Loewy. He was reenlisted by new president Sherwood Egbert, who in 1961 had been called in to wind up the affairs of the company, but instead fell in love with Studebaker. He brought Loewy back for a swan song and a gamble: a fiberglass-bodied sports car, the Avanti. With designers Bob Andrews, Tom Kellogg and John Ebstein, Loewy holed up in his Palm Springs villa for two months, working day and night. When the exhausted team flew back East, they carried with them the model of the

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sharp-edged, flip-tailed car that became an immediate hit with buyers. With its Coke-bottle shape, a narrowing in the middle inspired by European racing cars, the Avanti is still fresh enough to be influencing sports cars today. The car even survived the company. For more than a quarter-century since Studebaker folded, it has been produced by a small outfit in Ohio. But production problems prevented Studebaker from making the most of its success, and by November of 1963 Egbert was ailing. He left the company soon afterward.

The end came with the suddenness of a volcanic eruption on December 9, 1963, and in South Bend the operation was preserved almost like Pompeii. The blow was psychic and nearly physical. Word swept through town under gray skies: in South Bend, everyone remembers where he was when he heard, just as he remembers where he was when President Kennedy was shot, not three weeks before. Tony Caralla was at his garage and parts place in The Bronx when the word came. "What are you going to do?" a customer asked him. He shrugged. Studebaker was gone, but Studebakers were not.

Some blame management for the end, others the union or Detroit. It was the abruptness of the end that remains in memory. Studebaker had averted so many crises before, it was hard to believe it wouldn't do it again. Instead, it vanished like a lost civilization. No wonder the SDC's endeavors often seem archaeological. The parts row of the SDC swap meet suggests more than anything else the excavation of some ancient city. Artifacts, some rusted, some fresh, are assembled beneath tarps. Fenders and hoods sit together like partially assembled skulls.

Today, the largest parts supplier is Newman and Altman, whose inventory is as complete as the one in Tony Caralla's head. Its headquarters is in South Bend, in the dark, cool confines of an old brick building adjoining the original Studebaker factories. Wooden shelves and cases lend it the air of an old-time main-street hardware emporium, this one filled with fenders and door handles, headlamps and engine blocks, hood ornaments and radio knobs. It is 1963, bottled and capped.

Much of the rest of South Bend around the Studebaker facilities seems frozen in time as well. The sprawling complex of brick factories and offices, many of them dating back to the days of the wagons, seems not to have changed much from the day the factory whistle last blew. What was once the largest Studebaker dealership is now the Studebaker National Museum. Director Ron Radecki's grandfathers both worked in the plant, one as a saddler, one as a woodworker; and so did his father. He recalls meeting him at the Garst Street gate after his shift, and how he would be home

The Studebakers that most of us remember are the 1950 and '51 models. Suddenly they were everywhere.

when the work force was laid off for the annual model change. "I thought all fathers had a two-month vacation in the summer," he says wryly.

The Studebaker brothers were savers. The museum has everything from the brothers' early ledgers (including a volume that covers 1855 to 1864) to a collection of checking templates—wooden constructions, finely made in the carriage tradition, used to check metal parts stamped from dies against the shapes of the designers' clay models. There are acres of blueprints and drawings and steel-engraved catalogs of vehicles from ice wagons to manure wagons, spring-cushioned carriages to chuck wagons. The first Studebaker made in South Bend is here—a Light Six, whose tire treads are composed of raised letters endlessly repeating "NO SKID"—and the last, a 1964 Daytona.

Outside the museum, the Studebaker Drivers Club keeps the legacy alive. At the national meets, Studebakers again roar and dash, if only among the hairpins of an abbreviated road rally course laid out with orange safety cones in a mall parking lot. They are judged for splendor and accuracy of restoration. But most of all, Studebaker drivers swap and buy parts. They fix the cars because they cannot fix larger things. They rebuild the cars because they cannot rebuild the world that the cars came from.

They're no longer alone on their trip into nostalgia. Lately, Studebakers have been rediscovered by the wider culture, although with a campy air that the old guard deems unworthy. They've shown up, like '50s golden oldies hit songs, in commercials—for Wendy's and Levi's Dockers trousers—and in films, from *The Muppet Movie* to *The Color Purple* and *Avalon*. There are restaurants and nightclubs named "Studebaker's." (One, down the road from the national meet in Springfield, promises "non-stop bop.") In recent years, more and more of Tony Caralla's calls have been from such places: one Manhattan restaurant wanted a whole Studebaker to decorate its dining room.

Two years ago Caralla finally closed his garage, sold his valuable signs to collectors for $300 each, shipped two truckloads of parts to an Indiana dealer and stored the rest in his own garage, behind his house in The Bronx. Now, he says, "I've got 20-inch aisles in my warehouse." He doesn't need to skate to get parts, he can reach them.

Not long ago the Manhattan chapter of the SDC decided to surprise Caralla. They took him back to the old Studebaker repository on 131st Street. A toy factory now occupies the floor where Caralla once raced on his roller skates, but on the facade of the solid building the big stone wheel of the original Studebaker logo still rolls on, with a momentum that transcends mere physics.

Almost everybody stared the first time they saw one;
it gave off a sense of moving ahead—but not too fast.

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Salander-O'Reilly Galleries, New York

By Bennett Schiff

Stuart Davis was modern right down to his very roots

It took him years to come to terms with the Armory Show; and then he let loose with joyous paintings bursting with the freedom of jazz

Stuart Davis may have been the least arty of the great American painters, but he was also, it becomes clearer every day, the most purely artful. He was at the very least an astringent man, and I can still, some 35 years later, see the flicker of a dry smile on his deadpan face as the suggestion was made that he was full of art. Smile or not, the evidence was everywhere.

There was no room, not a breath, not an inch, for pretension in either Davis' person or his art. Both were straightforward, decisive, pungent, inventive. And tart. Also, spare, highly charged, dynamic. And cool. Hip, too. Especially hip, since no artist was more involved, in his person and in his art, than Davis was with American ragtime and jazz, which he discovered early and which stayed with him, as he stayed with it, listening to it, living with it. And painting it—a seminal part of the authentic American scene that he so loved—right to the end in 1964, when he died at the age of 71.

It has been more than a quarter of a century since this country has brought together a show of any real size of Davis' work. Now New York's Metropolitan Museum of Art has mounted an exhibition that seeks to do him justice as one of this country's greatest painters. The show, which opened last month and runs through February 16, will go on to San Francisco's Museum of Modern Art. It contains 175 paintings, gouaches, watercolors and drawings. The fact that the exhibition celebrates the 100th anniversary of Davis' birth is less important than the refreshment it offers to the eyes of an entire generation of Americans who seem unaware of his existence.

One evening in the late '50s, at an opening at Edith Gregor Halpert's Downtown Gallery (which was by then fashionably uptown, occupying an elegant limestone and marble town house on 51st Street between Madison and Park), Davis and I talked not about art but about jazz and where you could still hear it in New York. He looked oddly out of place at a gallery opening, a medium-sized man on the short side, wearing a dark business suit and—the only concession to the popular idea of what an artist should look like—a plaid shirt. A cigarette was stuck into the corner of his mouth like a mobile exclamation mark. He was graying by then, but there was nothing in the least grandfatherly about him. He had, instead, the easy informality and directness of expression and manner you had come to expect. Once he thought you had something to say he made you feel right at home.

He had spanned early in his lifetime the great divide between what had been conventional in painting from its very beginning—the re-creation on a two-dimensional surface of how things looked—to 20th-century modernism, which had more to do with what things are, and more important, with the life and autonomy of the painting itself. And he had spent the rest of his life working at it, developing it, finding the essence of it, being an artist—searching.

It was the biggest show in town

Already a radical in the subject matter of his pictures—he was, after all, a disciple in good standing of the Ashcan School—the really big step was to recognize that subject matter had suddenly become a secondary issue. By more than any other single event in America, the presence of modernism in art had been unveiled at an opening in February 1913 at the 69th Regiment Armory in New York City. Its official name was the International Exhibition of Modern Art, but it was known forever after simply as the Armory Show.

The very idea of it was audacious, something like 1,300 paintings, drawings, sculptures, watercolors and prints ranging from mid-19th-century romantic and classical French painting to the Impressionists, Post-impressionists, Fauves and Cubists, including many of the great names of our time: Brancusi, Braque, Cézanne, Kandinsky, Maillol, Matisse, Picasso, Van Gogh, among them. There was also an American section, more than half of the entire show, selected by American painter William Glackens, which included

Self-portrait (1912) was painted the year before Davis would reel under the impact of the Armory Show.

five watercolors by Davis himself; he was then only 20.

Walking through the show, submersing himself in it, Davis was astonished by what he saw. "I responded particularly to Gauguin, Van Gogh and Matisse, because broad generalizations of form and the non-imitative use of color were already practices within my own experience. I also sensed an objective order in these works which I felt was lacking in my own. It gave me the same kind of excitement I got from the numerical precisions of the Negro piano players in the Negro saloons, and I resolved that I would quite definitely have to become a 'modern artist.'" he wrote. In later years he found it illuminating to look closely at the work of Aubrey Beardsley, Toulouse-Lautrec, Seurat, Fernand Léger and Picasso. As it turned out, becoming a modern artist was more difficult than becoming an artist had been.

Illustrating bedtime stories for his brother

In an autobiographical monograph published by the American Artists Group in 1945, one of a series by different artists of the time, Davis segues into his life as an artist in a typically smooth and sophisticated prelude: "In writing autobiographical sketches," he says, "it is not unusual for artists to dwell on the obstacles they have had to overcome before gaining opportunity to study. But I am deprived of this satisfaction because I had none. The reason for this is simple. My mother, Helen Stuart Foulke, and father, Edward W. Davis, were artists. . . ." In her comprehensive book on Davis, Karen Wilkin writes that his father was said to have illustrated the bedtime stories he told him as he went along, and that it was expected that Stuart would do the same for his younger brother, Wyatt.

Davis' parents had met as students at the Pennsylvania Academy of the Fine Arts in Philadelphia. At the time of his birth in 1892 his father was art editor of the *Philadelphia Press*. These were the days when news stories—especially those involving disasters, accidents and mayhem in general—were illustrated at the scene by quick-sketch artists. Working for Davis' father were John Sloan, George Luks, William Glackens and Everett Shinn. Those four, joined and led by Robert Henri, who had been a student at the Academy, formed five-eighths of the group that later became famous in New York as "The Eight," proprietors of the Ashcan School.

In 1901, when Davis was 9, his father took the job of art editor and cartoonist at the *Newark Evening News* and moved his family to East Orange, New Jersey. New York City was just next door, heaven. Davis senior later became art editor of the nationally prominent magazines *Judge* and *Leslie's Weekly*, which were both published in New York.

Robert Henri opened his own art school there, in Greenwich Village, in 1909 (SMITHSONIAN, May 1984). By then, Davis had completed one year of high school. With his parents' blessing, he dropped out and began studies with Henri. He was 16.

"For the novitiate," Davis wrote, "acceptance on an equal footing with the other members involved the purchase of a large quantity of beer. Subtlety played no part in bringing this intramural statute to his attention. In my own case, the athletic George Bellows was called in from an adjoining studio to insure speedy acceptance of the proposal." These were good times for both work, which was hard, and play, which was too.

In addition to mastering the tools of his trade, Davis learned, more than anything else, to look intimately and knowingly at the world he lived in. This was, in essence, the discovery of the Ashcan School. They

Salander-O'Reilly Galleries, New York

Ebb Tide, Provincetown (1913): Ryder, Munch and others opened artist's eyes to issues of color and form.

The author, former Art Editor of SMITHSONIAN *and a frequent contributor, wrote most recently about Georges Seurat, in the October 1991 issue.*

Museum of Modern Art

In the '20s he tackled Cubism; *Lucky Strike* looks like a collage but is a painting.

Collection of Jon and Barbara Landau

In *Lemon and Glass* and other works of the mid-'20s, Davis stripped down his forms as he studied Léger, in particular.

painted the everyday world as they saw it, intimately and with sensitivity. They abjured the conventional work of the day, the academicism that called for heroics, idealization, noble themes. They abhorred the stuffiness and lack of reality of the establishment, its puffed-up visions, its lack of air. The air they sought was in the alleyways of slums. If it wasn't always exactly perfumed, at least it was real. And so, Davis wrote, "Art was not a matter of rules and techniques, or the search for an absolute ideal of beauty. It was the expression of ideas and emotions about the life of the time."

And here it is instructive and entertaining to quote Davis at some length, because artists writing about themselves have rarely been better at it than he was (mostly, they are awful when they write about their art or, sadly, anything else): "Enthusiasm for running around and drawing things in the raw ran high. In pursuance of this compulsion [some fellow students] and myself toured extensively in the metropolitan environs. Chinatown, the Bowery, the burlesque shows, the Brooklyn Bridge, McSorley's Saloon on East 7th Street, the Music Halls of Hoboken; the Negro Saloons; riding on the canal boats under the Public Market. . . .Coleman [another student] and I were particularly hep to the jive, for that period, and spent much time listening to the Negro piano players in Newark dives. . . . The pianists were unpaid, playing for love of art alone. In one place the piano was covered on top and sides with barbed wire to discourage lounging and leaning on it. . . . But the big point with us was that in all of these places you could hear the blues, or tin-pan alley tunes turned into real music, for the cost of a five cent beer."

It seemed "fantastic," he wrote in later years, that stepping out of his Greenwich Village apartment and "after a healthy hike of two blocks we dive into a joint where the great Earl Hines is sadistically murdering a helpless piano." He revered the musicianship of James P. Johnson, Pete Johnson, Vic Dickenson, Max Kaminsky, Frankie Newton and many others. "At one time or another, in darker mood," he wrote, reflecting

Phillips Collection, Washington, D.C.

With the Egg Beater Series (here, *No. 4*) Davis mastered Cubism by doing variations of one still life for a year.

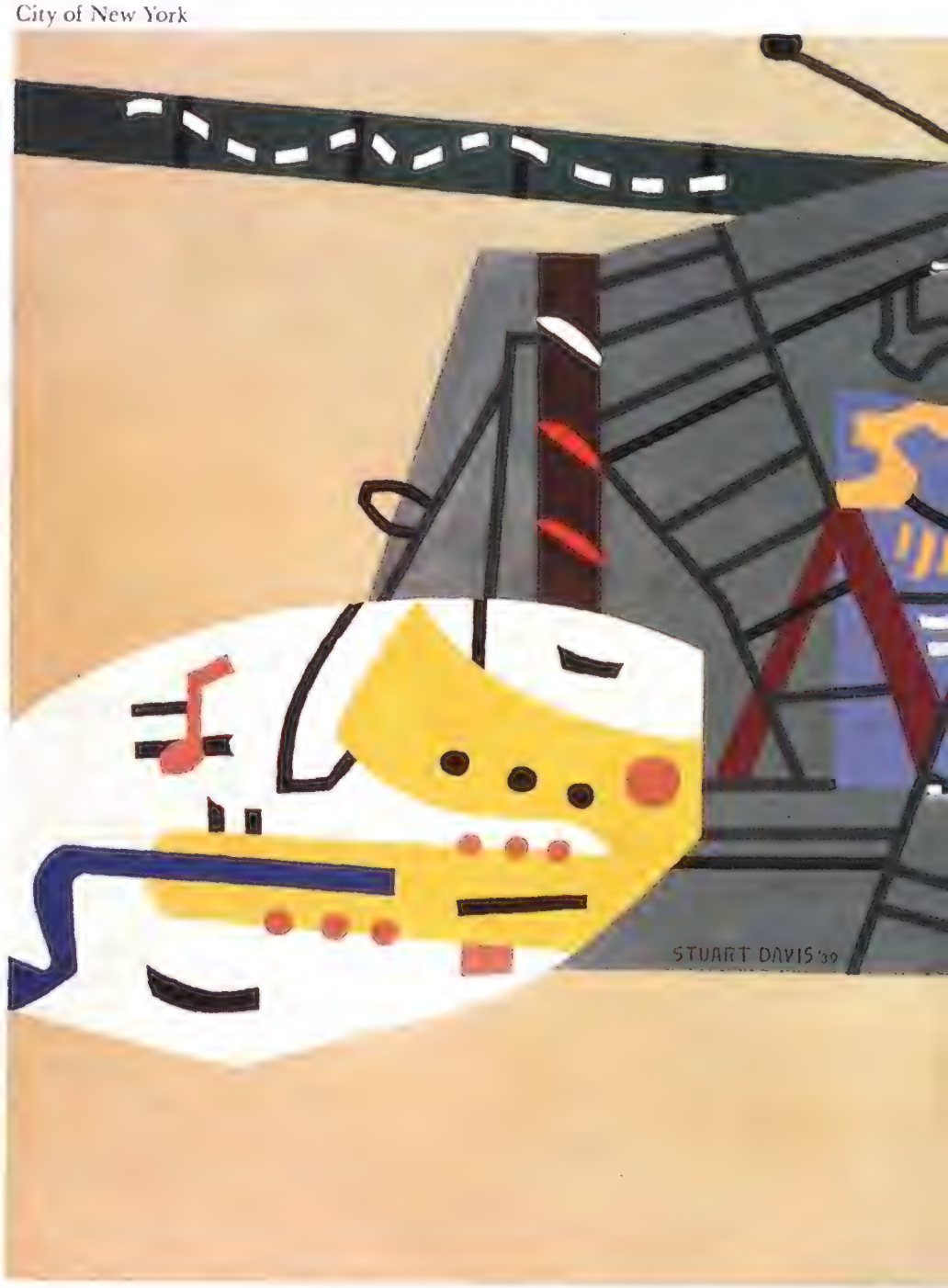
on their talent, "I have questioned the possibility of cultural advance in the United States, but on the evidence here presented I guess I must have been wrong."

Describing a mural he had done in 1939 for radio station WNYC, then owned by New York City and in many ways a model of what public broadcasting can be, he wrote, "the tonal intervals of music have their counterpart in painting in intervals of tone, color, contrast, size and direction." And, in describing his painting *Hot Still-Scape for Six Colors—Seventh Avenue Style* of 1940 (pp. 68-69), he said: " 'Hot' because of its dynamic mood, as opposed to a serene or pastoral mood. Six colors, white, yellow, blue, orange, red, and black were used as the materials of expression. They are used as the instruments in a musical composition might be, where the tone-color variety results from the simultaneous juxtaposition of different instrument groups."

But all of this came later in Davis' work. First he had to get modern. It took about 15 years, dating from his encounter with the Armory Show in 1913. At that time Davis had studied with Henri for three fruitful years and had then left the Henri studio to work on his own. He was 20 and, following in his father's footsteps, he was doing covers and illustrations for *The Masses*, cartoons for *Harper's Weekly* and various assignments for *Harper's Bazaar*.

By now, already the subject of reviews in the newspapers, Davis was under way. "With this steady employment I set sail for Provincetown, Mass.," he wrote. "Provincetown was a new experience for me." For the city-bred Davis, this was an understatement. His first day there, for example, eager to get out on the water, he rowed around until nightfall and then tied the dory to the wharf behind his rooming house. The next morning he found the boat hanging perpendicular—a fact observed with good-natured glee by the local

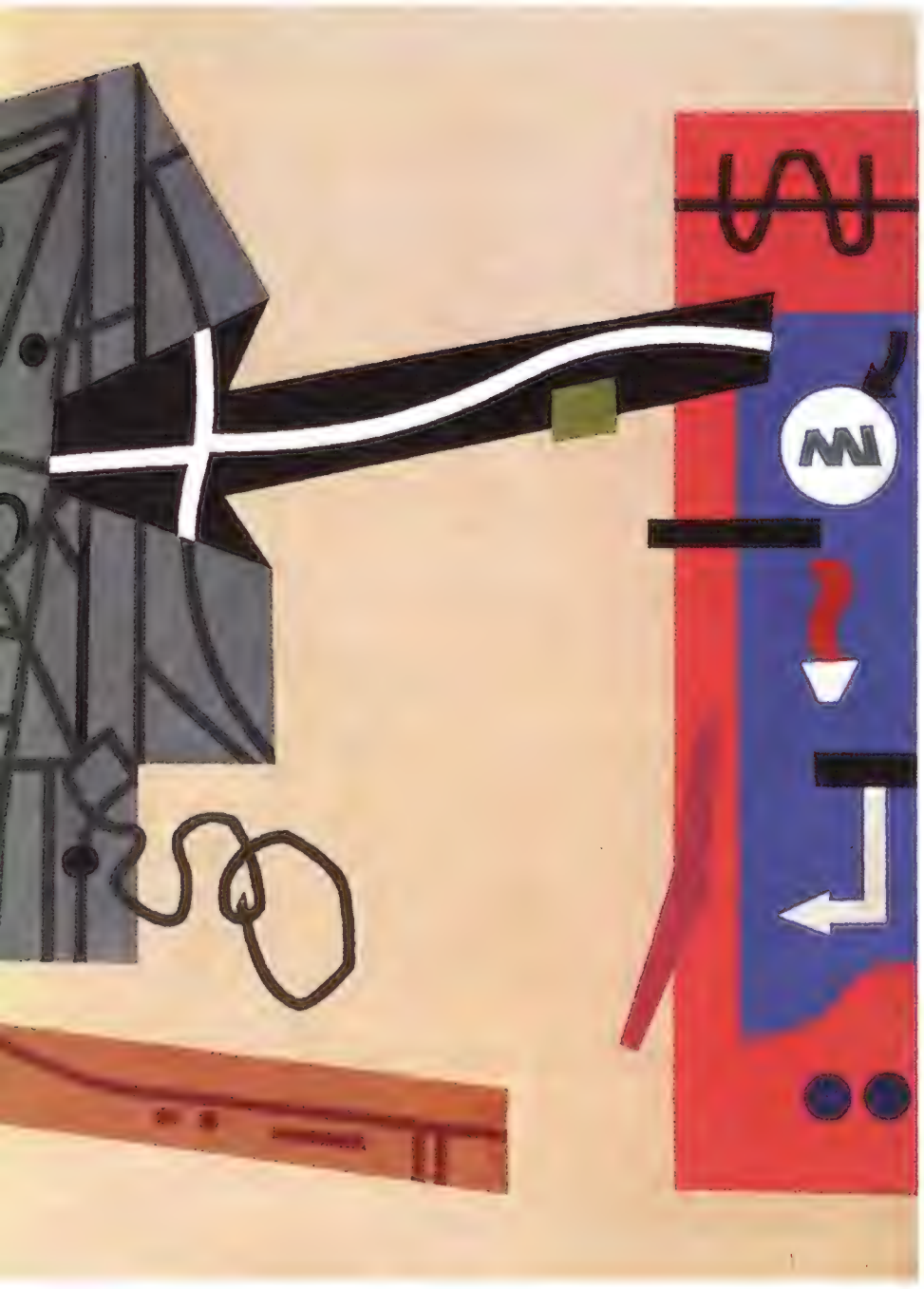
City of New York



Davis combined everyday imagery—sailboat, clarinet, sax, antenna—in a 1939 mural for radio station WNYC.

Museum of Modern Art

For *Visa* (1951) he was inspired by subject matter at hand—the word "Champion" on a matchbook cover.



There is also an electrical panel; radio waves tie it all together in his depiction of radio transmission.

folks, who knew about falling tides. But Davis loved it there and, as he later wrote, he became a "continuing addict of the New England coast."

What struck Davis in Provincetown, and later in nearby Gloucester, which became his favorite place on the coast, was the force, clarity and brilliance of the light. It was, he wrote, "greater than I had ever seen and while this tended to destroy local color, it stimulated the desire to invent high intensity color intervals." The idea of color intervals, his way of phrasing the concept, and his realization of it, was to stay with him for the rest of his life. Later he was to expand the idea into a theory he called color-space logic. The masts of schooners in Gloucester, he found, were not only beautiful in themselves but also defined empty skies. "They make it possible for the novice landscape painter to evade the dangers of taking off into the void as soon as his eye hits the horizon."

These early landscapes, simplified, broadly brushed in places, high-keyed in color, bright with light, show the indebtedness of the young artist to painters he had discovered in the Armory Show—Van Gogh, Matisse and Gauguin. Fully realized works of art in themselves, they also served as the blueprints for Davis' work to come. Rather than completing a painting on the scene, he developed a system of abbreviated sketches that he later orchestrated into paintings in the studio. Between 1916 and 1920 he used brushwork and color for emotional expressiveness. Cubism had its effect, as did a precisionism that might be traced in part to the French collagists and to the American trompe l'oeil painter William Harnett. He was now working with an entirely new syntax. He was becoming a modern painter. By the early 1920s his work was more Cubist than it was Postimpressionist or Fauvist.

Studying one still life for a year

By now he was seeking "a generalization of form in which the subject was conceived as a series of planes and the planes as geometrical shapes." In 1927 he hit this problem head-on, defining his art forever after. For one full year he painted the same simple subject time and time and time again, but the subject was, in itself, of little interest and importance. What was important was the relationship of line, plane and color.

His subject, if it can be called that, was a still life composed of several disparate and inharmonious ingredients—an eggbeater, an electric fan, a rubber glove—scattered on a tabletop. This simple arrangement of objects was his battleground for working out permutations of color, space and plane.

At the end of that monumental year's work on what came to be called the Egg Beater Series, Juliana Force,

Amon Carter Museum, Fort Worth

In *Blips and Ifs* (1963-64) the artist used his own signature (at top) as an element of the composition.

director of the Whitney Studio Club, the forerunner of the Whitney Museum of American Art, bought two of his paintings. "Having heard it rumored at one time or another that Paris was a good place to be," Davis wrote, "I lost no time in taking the hint. With one suitcase I hopped a boat and arrived in the center of art and culture in the middle of June. The rumors were correct. . . ." Davis didn't, in fact, hop the boat by himself. He was accompanied by a young woman from Brooklyn named Bessie Chosak, of whom little is known except that his parents didn't approve of her. Stuart and Bessie were married in Paris in 1929, but she died three years later. (In 1938, Davis married Roselle Springer, and in 1952 she gave birth to their son, George Earl, named for jazz musicians George Wettling and Earl "Fatha" Hines.)

In Paris, Davis looked up a friend from Gloucester, Elliot Paul. An American expatriate gourmand and man-about-town, he had written the book *The Last Time I Saw Paris* and edited the prestigious avant-garde magazine *transition*. Davis fit right in with all of this. Paul wrote an article about Davis' work for *transition*, and Davis got to see Paris the way he had gotten to see New York and Hoboken.

"I had the feeling," Davis wrote, "that this was the best place in the world for an artist to live and work, and at that time it was. The prevalence of the sidewalk café was an important factor. . . . There was no feeling of being isolated from America, as I met practically everyone I had ever known at one time or another during the year." The French were all right as well, but not the language they spoke. Davis couldn't comprehend it. It was a great misfortune not to speak French, he wrote to his parents, but it was impossible to learn it in a short time: "The pronunciation is mysterious, arbitrary and obscure. In fact I don't think the Frenchmen know what they are saying half the time." Six months later he hadn't changed his mind. "Of course," he wrote, "I can't speak a word of the language and never will I'm sure. The bloody Frenchmen can't even understand each other so what chance have I got?"

Frequenting the Village jazz haunts

The Egg Beater Series had confirmed Davis' esthetic convictions, and given him a metaphysical foundation. In Paris, although he returned to a linear, cool-toned, representational way of recording the city in paintings of fluent grace, his foundation was solid for all he did afterward. Davis' Paris paintings are songs of the city, street scenes that record the spirit of a place.

Above all, Davis was an urban man, and when he returned to New York he took up his work of transforming that city into art. A dedicated and furious worker, for most of his mature years he didn't stray far from Greenwich Village, where he lived, worked and listened to jazz. He wrote voluminously about art, 15,000 pages of notes that are now at Harvard's Fogg Art Museum, the gift of his widow.

In the Depression years he found a subsistence livelihood through the federal art projects. He painted a mural for the men's lounge of the new Radio City Music Hall, which he characteristically called *Mural (Men Without Women)*, now in the collection of the Museum of Modern Art in New York; a giant mural, 45 by 140 feet, for the New York World's Fair, which was subsequently destroyed; the mural for radio station WNYC; and one called *Swing Landscape*, now at Indiana University. Done in 1938, the latter measures 7 by 14 feet and, typifying its name with remarkable exactness, must be one of the most exhilarating and lyrical walls in the United States. And there is his other mural masterpiece, *Allée*, 8 by 33 feet, more grave, more solid, perfectly tuned, keyed and pitched, a work of the '50s, at Drake University in Des Moines.

Davis knew just what he wanted from a mural. "An art of real order in the material of paint doesn't say

It was an unlikely alliance.

But when five state governments, two wildlife conservation groups and one energy company came together, 32 species of threatened wildfowl secured a brighter future.

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It was an unlikely alliance. But when five state governments, two wildlife conservation groups and one energy company came in with concern and came out with solutions, it seemed more inspired than unlikely, after all.

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'Workers of the World Unite'; it doesn't say 'Pasteur's theory had many beneficial results for the human race,' and it doesn't say 'Buy Camel cigarettes'; it merely says 'Look, here is a unique configuration in color-space.'"

His subject matter was all of American contemporary life. Although he dismembered it, exploded it, dissected it, its parts were always recognizable. It was his orchestration that was so remarkably independent, innovative, specifically articulated in line, plane, color and symphonic organization. An article he wrote for *Art News* entitled "The Cube Root," in 1943, explains his aims: "I have covered the dynamic American scene for many years past, and all of my pictures (including the ones I painted in Paris) are referential to it. They all have their originating impulse in the impact of the contemporary American environment. . . .

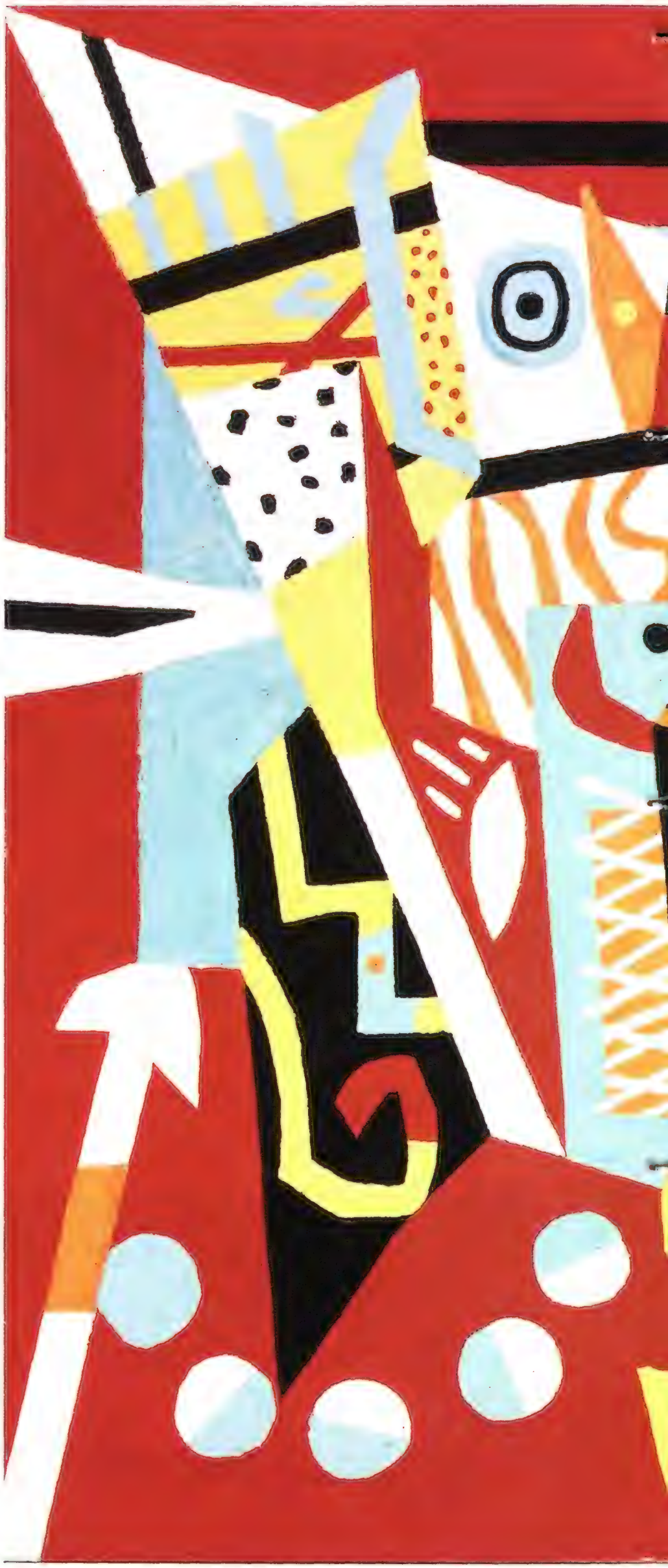
"Some of the things which have made me want to paint outside of other paintings are: American wood and iron work of the past; Civil War and skyscraper architecture; the brilliant colors on gasoline stations; chain-store fronts, and taxicabs; the music of Bach, synthetic chemistry; the poetry of Rimbaud, fast travel by train, auto and aeroplane which brought new and multiple perspectives; electric signs; the landscape and boats of Gloucester, Mass; 5 & 10 cent store kitchen utensils; movies and radio; Earl Hines hot piano and Negro jazz music in general, etc. . . . Paris School, Abstraction, Escapism? Nope, just Color-Space Compositions celebrating the resolution in art of stresses set up by some aspects of the American scene."

Davis, from the beginning, had made clear his indebtedness to a handful of European masters. But, as H. H. Arnason pointed out in an essay for the catalog of a major exhibition of Davis' work in 1957, "his paintings of the last twenty years are not only entirely different from those of cubism or futurism or Picasso or Léger, they are entirely different from anything that has been produced in Europe at any time and, one sometimes feels, from anything that could be produced in Europe."

"I am an American born in Philadelphia of American stock. I studied art in America. I paint what I see in America, in other words, I paint the American scene," Davis once said. He also said, "I could only keep looking at a manageable hunk of the world and keep trying to twist and shape it my way."

He was a Cubist, he said, "until they threw me a curve." And he hit it, cracked it clean out of the ballpark, way up there where it can still be seen, clean, pure, beautiful.

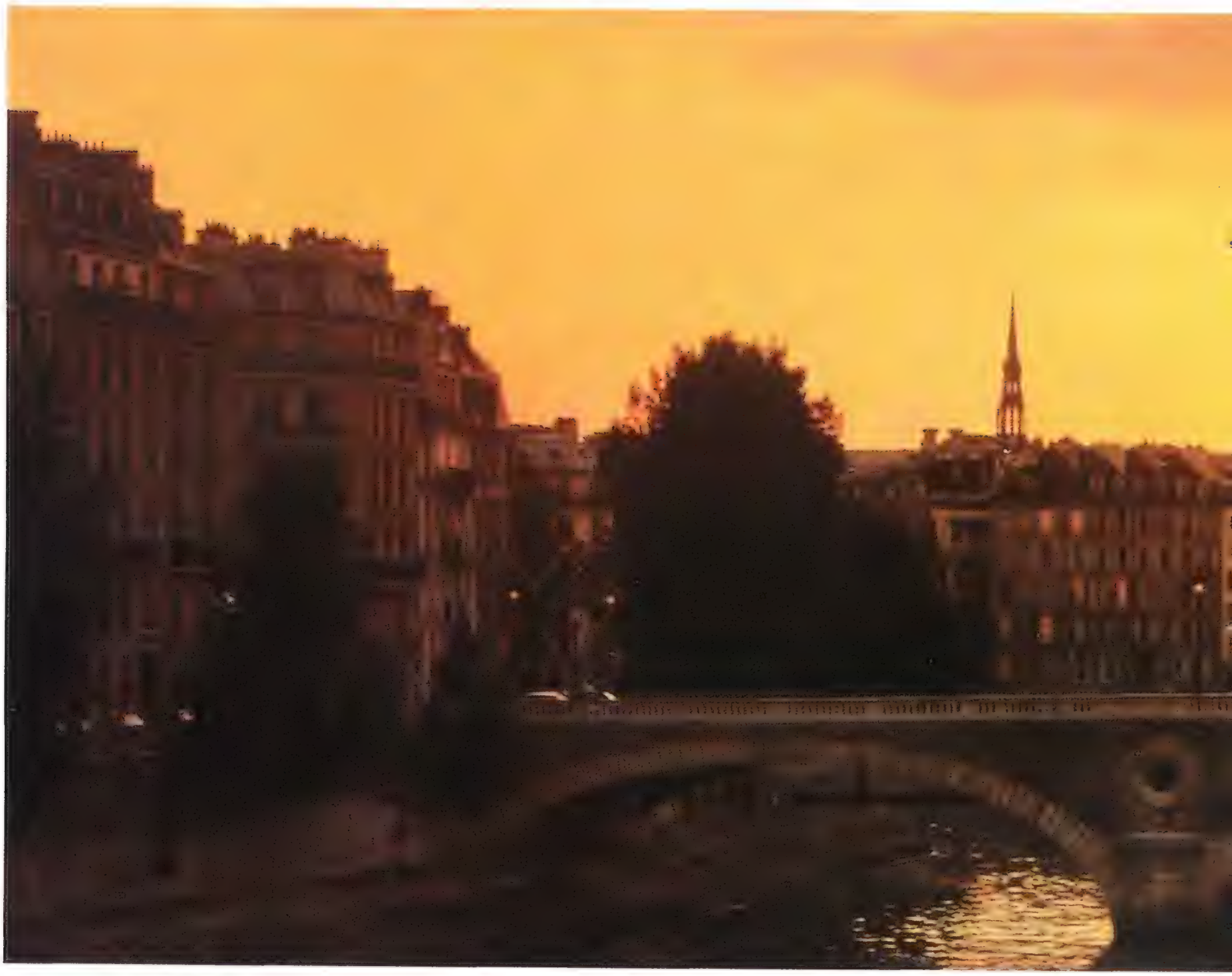
Museum of Fine Arts, Boston



Hot Still-Scape for Six Colors—Seventh Avenue Style (1940) is Stuart Davis' vision of the American scene.

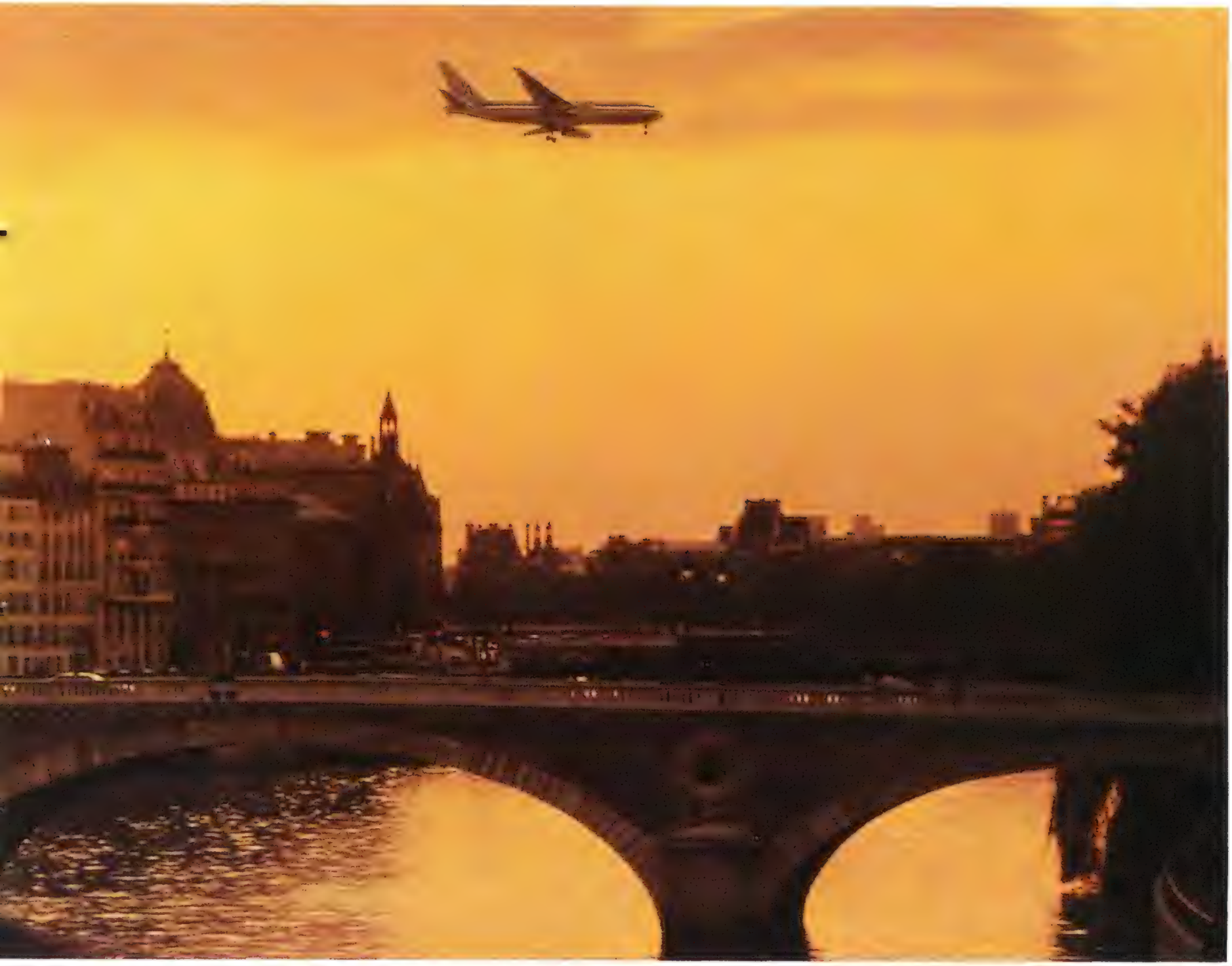
ALL ACROSS EUROPE,
AS THE NEW DAY ARRIVES,
SO DO WE.

AA



Pont Louis-Philippe, Paris.

FRANCE ITALY SWEDEN SPAIN BELGIUM



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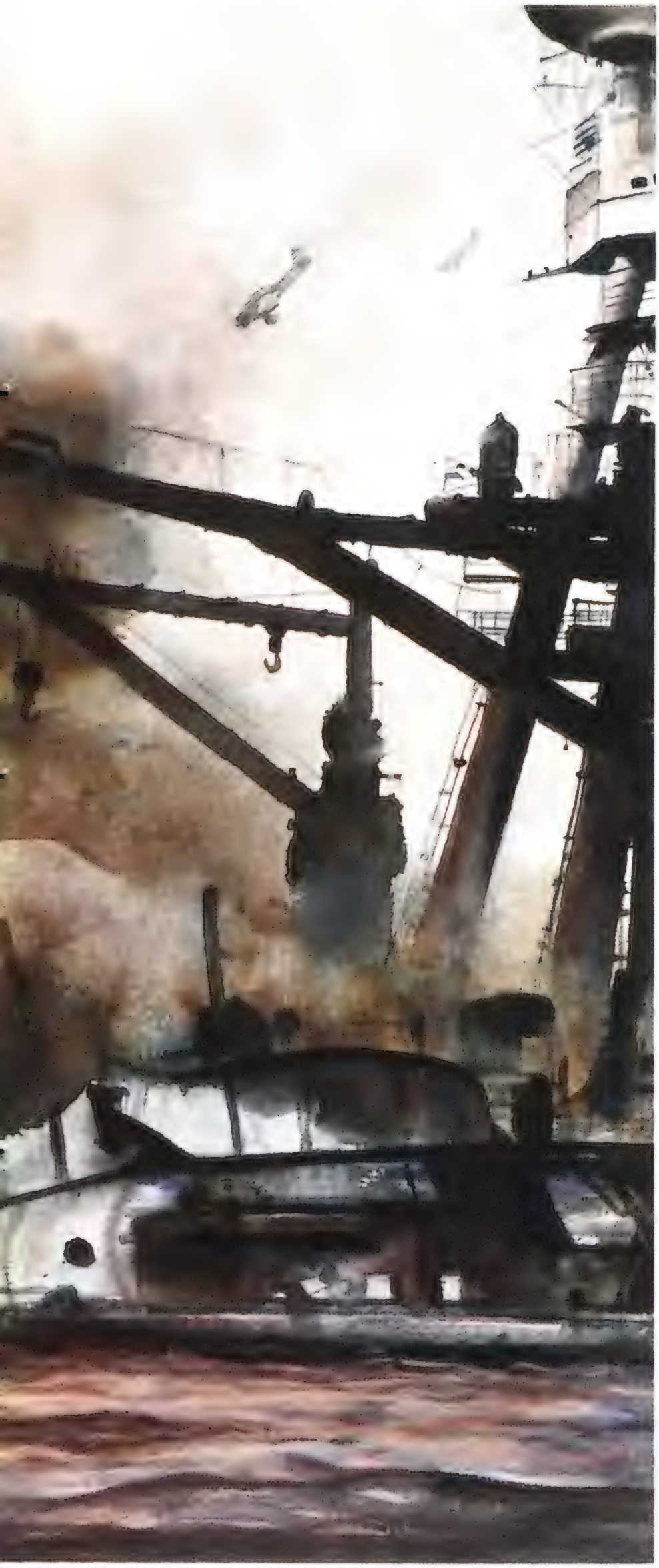


Smoke darkens the morning sky as the *Arizona*, her magazine hit by a Japanese bomb, slips beneath water.

Illustrations by Arthur Shilstone

By William Zinsser

At Pearl Harbor there are new ways to remember

Fifty years after the attack, the battleship Arizona *is both memorial to her crew and object lesson on a war that changed the world*

Like every American old enough to remember Pearl Harbor, I remember where I was on the afternoon of December 7, 1941, when I heard about the Japanese attack that pulled the United States into World War II and that would send me and my generation off to fight it. But what I remember most vividly is the first thought that popped into my head: Where's Pearl Harbor? I had never heard of it and had no idea why it was a place worth bombing. I was a typical pre-World War II American—a product of the cultures that had come across the Atlantic; my upbringing and my schooling had been pointed toward England and Europe, Greece and Rome. Asia was "the inscrutable East" and it could stay that way.

Soon enough after that December day we found out where Pearl Harbor was and never again forgot it. For four years the cry "Remember Pearl Harbor!" rallied and sustained a military effort of immense scale and complexity, one that brought the geography of Asia and the Pacific crashing into our lives—Bataan, Guadalcanal, Eniwetok, Tarawa, Truk, Iwo Jima—and that was only ended by an even more cataclysmic event. The atomic bomb that fell on Hiroshima in 1945 was hatched from the bombs that fell on Hawaii in 1941—a drowsing, divided America was united overnight—and

the two nations have been psychically linked ever since by the two air raids that framed their war.

Today the words "Pearl Harbor" still echo somewhere in my head, as they do for all Americans of a certain age. December 7, 1941, is our great dividing line, not only because it brought the nuclear age but because the United States was never the same country again. In hundreds of ways as irreversible as the splitting of the atom, American life was altered by World War II. Yet I never had any particular urge to visit the place where it all began. My Pearl Harbor was well preserved in the form of old newsreels, still playing in my head, of crippled battleships and billowing black smoke.

But suddenly it was 1991, and I found myself wondering: What did the harbor really look like? How was it set among the hills that the Japanese planes came roaring over? What kind of monument had been built there to commemorate the day? Suddenly I wanted to know.

I got to Honolulu on a Sunday afternoon and checked into a hotel. I hailed a cab and told the driver to take me to Pearl Harbor.

"Where in Pearl Harbor?" he asked.

"Take me where you take all the other tourists."

"That's the Arizona Memorial," he said.

I said OK. Whatever it meant would be revealed. We drove across the verdant island of Oahu, out past the airport, until I saw a large, almost enclosed bay on my left. The taxi stopped at the visitors center next to the bay.

"Is that Pearl Harbor?" I asked the driver. He said it was. It was a placid body of water; I couldn't see a single vessel on it. *This* was Pearl Harbor? Bastion of naval might? I could have been looking out over Shiloh or Saratoga or any other long-asleep battlefield.

A large crowd of tourists was waiting for the next showing of an orientation film, and I joined the line filing into the theater. Inside, a National Park Service ranger told us that our program would last an hour. First we would see the film and then we would go by boat to see the sunken remains of the *Arizona*, where a memorial had been built honoring the 1,177 men who died when that battleship, her magazine exploding after a direct hit by a Japanese bomb, sank in nine minutes. "They died before they even knew who they were fighting, or why," the ranger said. Fewer than 100 bodies were recovered; the rest are still on the ship. On that December 7 approximately 350 Army and Navy planes were also destroyed or damaged, and there were casualties elsewhere. But of the 2,400 killed, including military and civilians, almost half went down with the *Arizona*. The ship still leaks oil every day.

I had almost forgotten the *Arizona*—if in fact I had ever focused on her as a separate Navy tragedy in the larger ruin of the day. I had lumped her with all the other ships that were damaged in Pearl Harbor, most of them eventually salvaged and sent back to sea. Now I understood why the monument I had expected to find, marking the events that I think of collectively as "Pearl Harbor," was largely a memorial to one ship; Pearl Harbor was, after all, a Navy base. Even so, the shrine had been a long time getting approved and built. Only after a decade of fundraising, lobbying and legislative jockeying was it finally dedicated on Memorial Day, 1962. As specified by the Navy, it took the form of a bridge, set on piers sunk into the harbor mud, that wouldn't touch the *Arizona* and would accommodate 200 people (p. 83).

Our orientation film quickly came and went. It was a pastiche of newsreel clips that reviewed the events leading up to World War II in Asia: Japan's seizure of Manchuria in 1931, its brutal invasion of China in 1937, its subsequent occupation of Indochina, and the months of polite diplomatic talks with the United States while Japan was preparing for war. We learned that the American government had broken the Japanese code but, through repeated bungling, failed to warn the commanders at Pearl Harbor. There was footage of the Japanese carriers launching their planes and of the attack itself, and its terrible swift rain of death and destruction. We heard about Adm. Husband E. Kimmel, Commander in Chief of the Pacific Fleet, who was quoted as saying the raid was "one of the most brilliantly planned and executed attacks ever achieved at the start of a war." The film hailed the Navy's glorious recovery—"like the mythical phoenix the fleet would rise"—and ended by saying that "the lesson of Pearl Harbor is that we must never be unprepared again."

William Zinsser is author of On Writing Well. *This article and one on the Civil Rights Memorial were adapted from his* American Places, *due next spring.*

Artist's rendering of the Japanese attack on Oahu shows flight plan of the two-phase raid: the first wave (red arrows) began at 7:55 A.M., the second came an hour later. Eight battleships were sunk or badly damaged, all but crippling the Pacific Fleet.

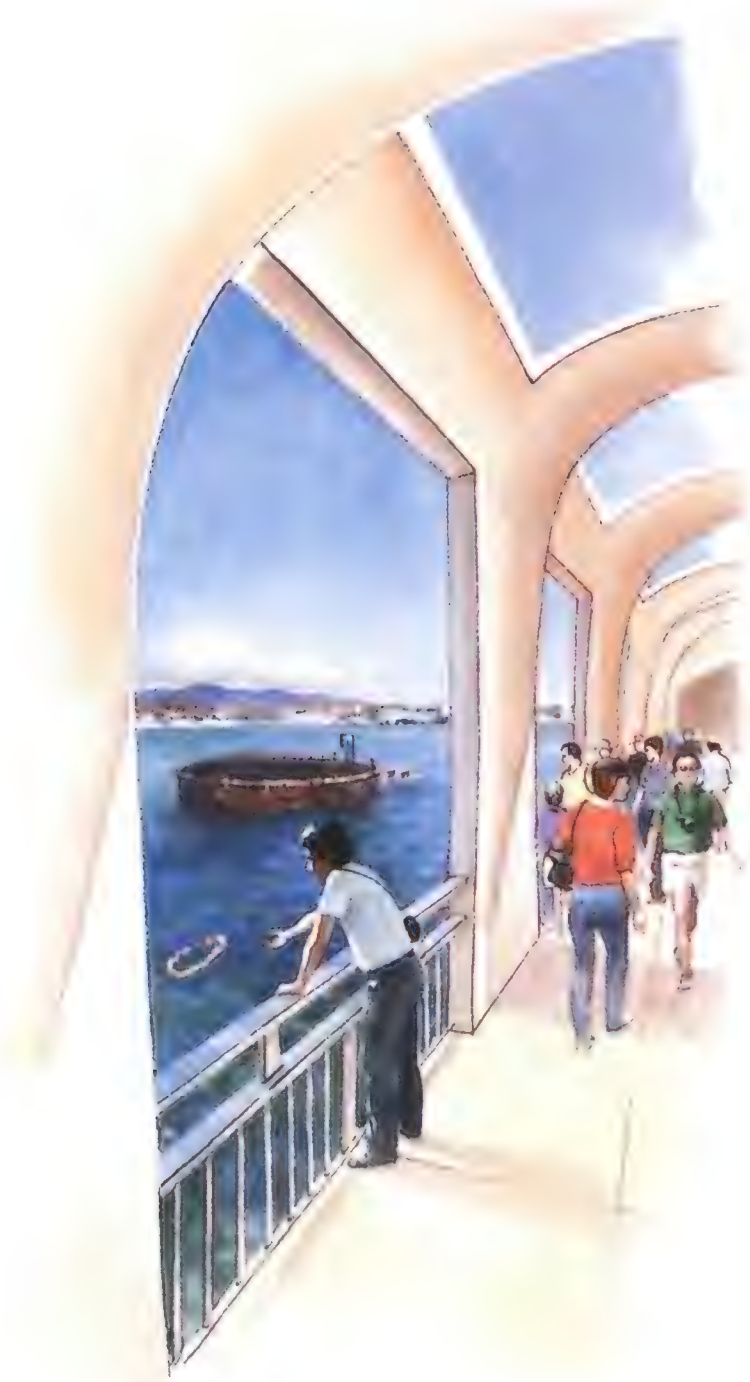
The show was just long enough to remind me of the newsreels of Japanese atrocities in Peking, Tientsin, Shanghai and other Chinese cities that ran like a nightmare through my generation's growing-up at the movies, especially the 1937 "rape of Nanking," in which at least 100,000 men, women and children were bayoneted, burned alive and otherwise slaughtered.

After the film we were herded onto a launch. As we bobbed across the water I noticed an elongated, oddly shaped white structure at the far side of the harbor, which I guessed was the memorial. Many of my fellow passengers were boys and girls in their late teens and early 20s: the same age as the sailors who had been sleeping on the *Arizona* on that long-ago Sunday morning, and as carefree. Many were older men and women whom I took to be World War II veterans and their spouses. Many were Japanese and Chinese tourists.

None of us seemed to know quite what we were

there to be shown. During the ride we were given no details of the Japanese attack—there were 130 vessels in the harbor, the raid began at 7:55 A.M., the first planes came over those hills over there. We were only asked to be respectful when we got to the memorial, and we were, staring silently down at the submerged skeleton of the *Arizona* and at the two gun turret mounts that still jutted above the water, and then staring silently up at the wall where 1,177 names—including 34 sets of brothers—were carved. Then, just as abruptly, we were back on the launch.

Out on the water again, I tried to imagine the horror and chaos of that distant December morning. Half a century hadn't dimmed the tactical brilliance of the Japanese attack. The Japan of 1941 was a poor, over-populated nation crammed into a space less than half the size of California. Over the previous half-decade it had become a military state ambitious to expand onto the Asian mainland to obtain the territory and resources it didn't have at home. With important portions of China and Indochina already in its hands, it was ready to strike at the Philippines, Thailand, and the British and Dutch colonies—rich in oil and tin and rubber—of Malaya and the Netherlands East Indies. A feeling of resentment toward the United States had long festered, and the recent American embargo on exports of oil and steel to Japan had brought hostility close to desperation. While the diplomatic talks and ultimatums eddied around them, the Japanese generals and admirals dreamed of a knockout punch. With America's Pacific Fleet destroyed, they could conquer the Philippines and the coveted countries of Southeast Asia with little opposition.



A Japanese visitor tosses a lei upon the waters; some leave apologies for bombing in center's comment box.

"If you want the tiger's cubs you must go into the tiger's lair," quoted Adm. Isoroku Yamamoto, who conceived the astonishing idea of bombing Pearl Harbor. At first he was opposed by the entire Japanese high command, who feared the necessary secrecy would be impossible to maintain. But Yamamoto pursued his plan, gradually refining it. His strike force of aircraft carriers would take a northern route across the Pacific that was off the main shipping lanes, turning south to their target from a point 1,000 miles north of Oahu. To test the emptiness of those waters, he sent an ocean liner to Honolulu and back, over the proposed route, with two naval officers aboard as observers. Scrutinizing the horizon with binoculars, they saw no other ships and only sparse air patrols north of Oahu.

Spying on "a lazy, relaxed base"

The fact that American patrol planes seldom flew north had already been provided by Yamamoto's secret agent in Hawaii, a young officer named Takeo Yoshikawa, who, in the protective coloring of an aloha shirt, had been monitoring daily life at Pearl Harbor since March and looking for patterns. One pattern he noticed was that American ships at sea invariably returned to Pearl Harbor by Friday afternoon and stayed there until Monday or Tuesday. Another was that on Sunday mornings Pearl Harbor was, as Richard M. Ketchum writes in *The Borrowed Years, 1938-41: America on the Way to War*, "a lazy, relaxed base under peacetime conditions, where many of the men slept late and many were on liberty, while those on duty appeared to be doing little more than killing time."

On November 26, in Hitokappu Bay, off the northeastern tip of Hokkaido, an armada of about 30 ships—including two battleships, three cruisers, an array of destroyers and six carriers with more than 400 planes—

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set out under a blanket of silence. Even the radio operator's sending keys had been removed. Twelve days later, just before 8 A.M., Lt. Comdr. Mitsuo Fuchida, who had been training his flight crews relentlessly since May, led the first wave of bombers down over Pearl Harbor, where nobody in America's Pacific Fleet, densely berthed in its landlocked anchorage, was expecting him.

I felt let down by my brief trip out to the *Arizona*—the experience had been so meager—but I also felt that more was going on than I could discern. At the visitors center big new crowds were waiting for the next film and browsing in the small museum and souvenir shop; they average, I was told, between 3,500 and 4,500 people a day, or annually, well over a million and a half. But who were they, and why did they come? Who were the kids? Who were the Japanese? I decided to return in the morning and get some answers.

On my way out I saw an older man standing by the information desk. He had a name tag—Arthur Critchett—and a "Can I help?" look, and I asked him if he worked there. He said he was one of eight or nine Pearl Harbor survivors who volunteer at the center, giving informal talks about what they saw on December 7 and just being available. Many of the tourists who gravitate to him are World War II veterans, eager to make a living connection with their own past. "If they were at Pearl Harbor on that day they always want to tell their story," Critchett said. I asked him to tell me his own story.

"It was a very quiet morning"

"I was a seaman 2d class on the destroyer *Dewey*," he said. "The *Dewey* was in Pearl Harbor for its annual overhaul. We were in a nest of destroyers about 200 yards off the north end of Ford Island, moored next to the USS *Dobbin*, a destroyer tender. It was a very quiet morning—part of the crew was ashore for the weekend—and after breakfast I was sitting on the fantail reading the Sunday paper. All of a sudden there appeared in the area a large concentration of aircraft, which was very unusual on a Sunday morning.

"It wasn't long before we knew something was amiss, because we could see large columns of smoke coming from Battleship Row. We could also see planes bombing air stations directly behind us—hangars and runways and planes sitting on the runways. We went immediately to general quarters. My station was the No. 3 five-inch gun on the aft portion of the *Dewey*, and from there I saw the *Arizona* blow up. I also saw the target ship *Utah* capsize, with many of her crew members sliding down her bottom into the water, trying to escape. Afterward, we were the last ship to leave Pearl Harbor, and hundreds of servicemen came swarming onto our ship, eager to go out and fight. They wanted to get into it. We had captains and we had commanders and all kinds of people."

Today the Hawaiian flag flies over people of many races; Japanese investors own most of Honolulu's big hotels.

Quite a few widows also seek out survivors like Arthur Critchett. "There's one lady who lost her husband on the *Arizona* who comes here every two or three years," he told me. "She gets very upset, but she says she just can't help coming every so often." Time doesn't soften the memory of the Japanese attack for those who were touched by it. "Even today," Critchett said, "any trip out to the memorial is very emotional for me. It still seems like yesterday."

That night at my hotel, I bought a copy of Walter Lord's *Day of Infamy* and settled down to read it. "Monica Conter, a young Army nurse, and Second Lieutenant Barney Benning of the Coast Artillery," it began, "strolled out of the Pearl Harbor Officers' Club, down the path near the ironwood trees, and stood by the club landing watching the launches take men back to the warships riding at anchor. They were engaged, and the setting was perfect. . . . For the first weekend since July 4 all the battleships were in port at once."

Nurse Conter and Lieutenant Benning were no more naive, no more frozen in a reverie of America the unassailable, than the servicemen on the scores of ships riding at anchor, or than I was, back East in college, or than were most Americans in the 48 slumbering states. One recurring theme that struck me in Walter Lord's sequential account of December 7 was the fact that people all over Oahu couldn't believe that what they were seeing—unidentified planes, falling bombs, rising smoke—was an enemy attack. It was just the Army fooling around, it was just this, it was just that—anything but the unbelievable truth.

"Remember Pearl Harbor!" The old cry still had some life in it. Once again I felt the fear and helpless-

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ness and the paranoia of that early wartime period, deepening as we got news from the Philippines of the Bataan Death March and other Japanese Army atrocities committed against our soldiers. Surely an attack as cunningly planned as the Pearl Harbor raid was only a prelude. Hawaii was about to be invaded! California was about to be invaded! If hundreds of Japanese planes could materialize out of nowhere, so could some Japanese divisions. Spies were imagined everywhere. Lights went out and blackout curtains went up and air raid wardens patrolled the beaches. Sabotage was the new goblin in our midst, its power so frightening that we massively betrayed—by uprooting and interning 146,000 American citizens of Japanese descent—the democratic freedoms we were at war to defend. "Remember Pearl Harbor!"

Yet in those 50 years something else has happened that nobody foresaw and that greatly complicates the experience of visiting Pearl Harbor today. To feel it I just had to walk out into the streets of Honolulu. It wasn't only that I was in a predominantly Asian city, its white population a minority outnumbered by native Hawaiians and people of Chinese, Japanese, Filipino, Korean and Vietnamese descent. Much of the city was now Japanese-owned, including the hotel I was staying in and most of the other Waikiki Beach hotels. The inscrutable East had become part of the fabric of American life. The enemy was now our landlord.

"We're dealing with a swirl of emotion here," said ranger Gary Warshefski when I went back to Pearl Harbor the next morning. "Before I took this job I visited the Arizona Memorial as a tourist, and while we were out there I saw an older American man shove an Oriental visitor and remove his hat and tell him to have respect. There were Americans with hats on, but he didn't approach them. I realized that at any site where feelings are that strong we have to be very careful, not only about what we say but how we say it."

Survivors of attack serve as volunteers at memorial, often swapping eyewitness stories with other veterans.

I had come to Pearl Harbor, Warshefski told me, at a turning point in the life of the Arizona Memorial and in the idea of what kind of site it should be. "To many people," he explained, "it's a national cemetery, strictly a monument to the dead, like the Vietnam Memorial, with a list of names and very little interpretation. But as that generation passes on, visitors are looking at it less as a memorial and more as a national historic area where they can learn about the history of the United States. To these generations coming along, the names of the dead will be meaningless unless they have some perspective on the events that led up to December 7—that whole history of ultimatums and oil embargoes and failed negotiations. One of the principal reasons why tourists from Japan come here is that Japanese education doesn't deal greatly with World War II, and they want to learn about the context of Pearl Harbor."

"Any opportunity for Japan-bashing"

Feelings, however, still run deep, and the Park Service, which took over administering the site from the Navy in 1980, urges tourists to express what they feel. "Those older men who are Pearl Harbor survivors have filled a big need," Warshefski told me. "Unfortunately, that resource is slowly leaving us. But our rangers also make an effort to provide that kind of help, and we also put a box for comments in a very obvious place at the front desk. 'Say anything you want,' we tell visitors, and they do. Their opinions are usually well reasoned and thought out. They range from 'Being prepared is no longer an appropriate theme—the memorial should be talking about peace' to 'Don't let the Japs buy any more of Hawaii.' "

"Japanese tourists here are very quiet and reserved," Donald E. Magee, superintendent of the site, told me. "There's a strong Japanese tradition of honoring the dead, and they're the ones who throw a lei on the water out at the memorial and say a little prayer. What causes much of the friction is that we've been getting a large number of Oriental people who are here from Singapore, Hong Kong and Taiwan on group tours—Pearl Harbor is a free stop for the local tour operators. But most of their tourists don't know the language or anything about the site. If they get restless or a little boisterous, many Americans assume that they're Japanese, and get hostile. They're the same ones who complain about the signs in Chinese characters on the restrooms. They're looking for any opportunity for Japan-bashing."

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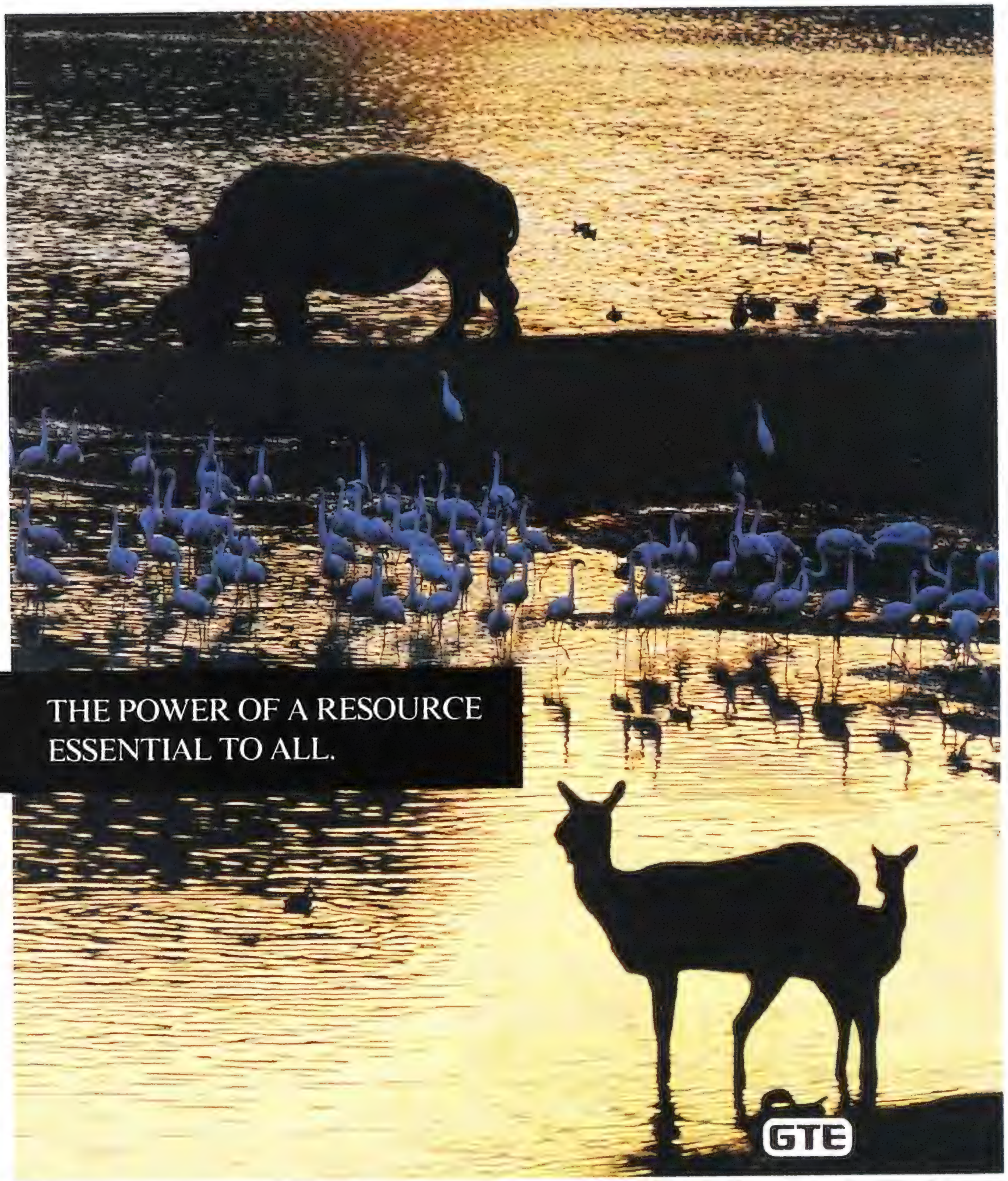

THE POWER IS ON

Other ways to remember Pearl Harbor

One recent basher left a note in the comment box that said, "How can you have a Japanese ranger?" One of the two Japanese-American rangers at the site, Stanley E. Igawa, is a third-generation American who was a high school student in Los Angeles at the time of Pearl Harbor. Interned in a camp for almost three years, he enlisted in the Army in 1945, served in World War II, and was later called up again for the Korean War and Vietnam. "I get both the positive and the negative," he told me when I asked about the incident, blaming much of the negative on the "annoying" Chinese tour groups and on the fact that most white Americans "don't know from Adam whether a person with an Oriental face is Chinese or Japanese or Korean or Thai or Indonesian." Positive reaction comes from World War II veterans who tell him how proud they were to have fought alongside the much-decorated Japanese-American 442d Regimental Combat Team in Europe, or who were with the 141st Infantry Regiment that was rescued from German encirclement by the 442d with heavy loss of life. Stanley Igawa would like to see American tourists at Pearl Harbor made aware of the role that Japanese-Americans played in many areas of the war effort, including the fact that they constituted the largest group of civilians killed by Japanese bombs on Oahu on December 7, 1941. "I'd like people from the mainland to know, 'Hey! We were caught in it, too!'"

Superintendent Magee's last post was at Stones River National Battlefield, in Tennessee, the site of a Union victory in the Civil War that, as he can now appreciate, took place conveniently long ago. Pearl Harbor offers no such refuge from living memory. It also carries different meaning for different visitors, depending on their age. "For older veterans it's a place they feel they have to see," he said, "and the lesson really is that America must never be unprepared again. Younger Americans see it as a peace memorial. Because of Vietnam they believe that war is not the answer to international disputes—that there have to be other lessons."

Such has been the funerary nature of the site that, when Magee arrived in 1989, he inherited a regulation prohibiting children from going out to the Arizona Memorial if they were less than 45 inches tall. Wondering how the policy originated, he found in the files a letter written by a previous administrator to a Congressman who had protested on behalf of the parents of a child who was insufficiently tall. "The Arizona Memorial is a place for quiet reflection," the letter explained. "Inappropriate behavior on the part of young children can negatively impact the experience. The height restriction is an attempt to address the problem." Magee soon lifted the ban. "I don't think children are too young to appreciate what that sunken ship represents," he told me. "They'll remember it if they see the leaking oil—if they see that the ship is still bleeding."

His own view is that the site should be informative and nonjudgmental. "The National Park Service does two things very well," he said. "We preserve history and we teach history. We don't take sides at Civil War battlefields or at any other sites where controversial decisions were made, like the Custer battlefield, and here at Pearl Harbor we don't condemn the Japanese. We want to find a more humanistic approach." Several new exhibits are being prepared, including a Japanese torpedo from the attack, which had to be disarmed. A new film will replace the present one next March; one point that it won't make is that eternal preparedness is the lesson of Pearl Harbor.

Seeing Pearl Harbor as a touchstone

"We're going to have to be more creative in showing that this was a war that changed America forever," said park historian Daniel A. Martinez. "Militarily, Pearl Harbor was a defeat, but socially it altered the country in many fundamental ways. It ended a depression. It gave government huge new social responsibilities. It reshaped the family unit: women went into the work force and children went to day care. It brought major demographic shifts—poor people who had never had opportunities came North to the big cities. It paved the way for civil rights and other realizations of the American dream. It brought huge advances in science and medicine—the most powerful one, of course, being the birth of the nuclear age."

Older tourists "see Pearl Harbor as a touchstone," Martinez said, "and they come here to fulfill a patriotic duty. Young people think it's a tourist attraction and expect to be entertained. But then the reality of what this place means hits them between the eyes. Suddenly they see that the freedoms they take for granted and

the vacation they're enjoying were bought and paid for by the previous generation, by people who were just their age when they died. It's not just palm trees and hula skirts. The waters here are sacred; the blood of thousands is in that water.

"The historic reasons for what happened at Pearl Harbor, the social, political and economic forces behind Japan's drift toward war, and why she attacked us, are almost unknown to the general public," Martinez said. "The absence of that knowledge is a serious deficiency in understanding the Arizona Memorial. Most visitors think the Japanese attack was just an aberration—some kind of spasm. How many of them understand the risk Japan took that day—that Japan in fact committed suicide that day? The Japanese themselves don't see Pearl Harbor as a victory site; to them it's the symbol of Japan's greatest mistake.

"We can never explain to tourists who are only here for an hour all the complexity," Martinez continued. "But we can try to show that, as misguided and misled as Japan was at that time, the Japanese also were people who had sons and daughters who went to war. And there's another story we should tell. After the war Japan rose out of the ashes of defeat. But helping it in its struggle was the very country it had attacked, and that American benevolence was what enabled it to prosper. How many conquering nations have extended the hand of recovery? Here at Pearl Harbor I think we can appeal to the qualities that made America great: fair play, understanding and forgiveness."

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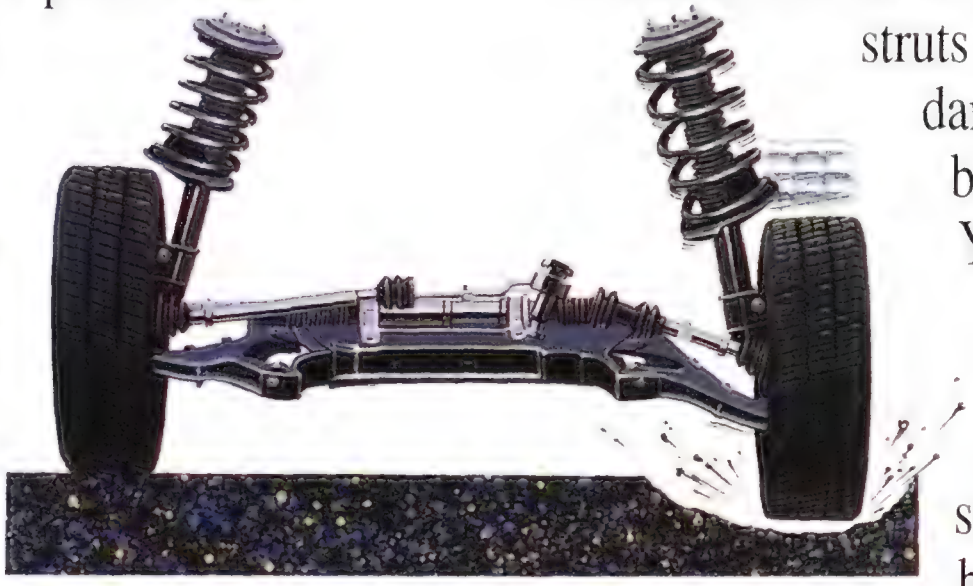

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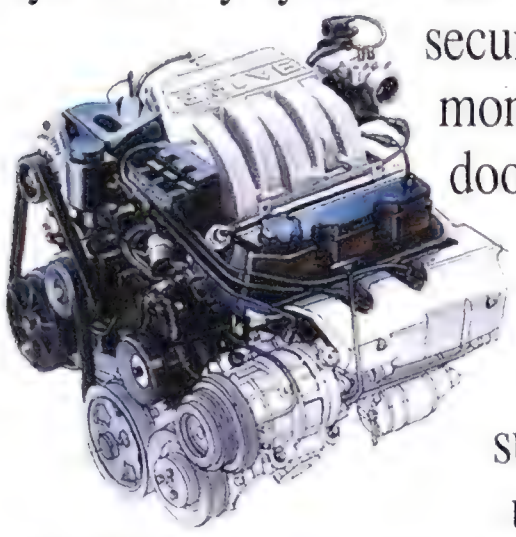

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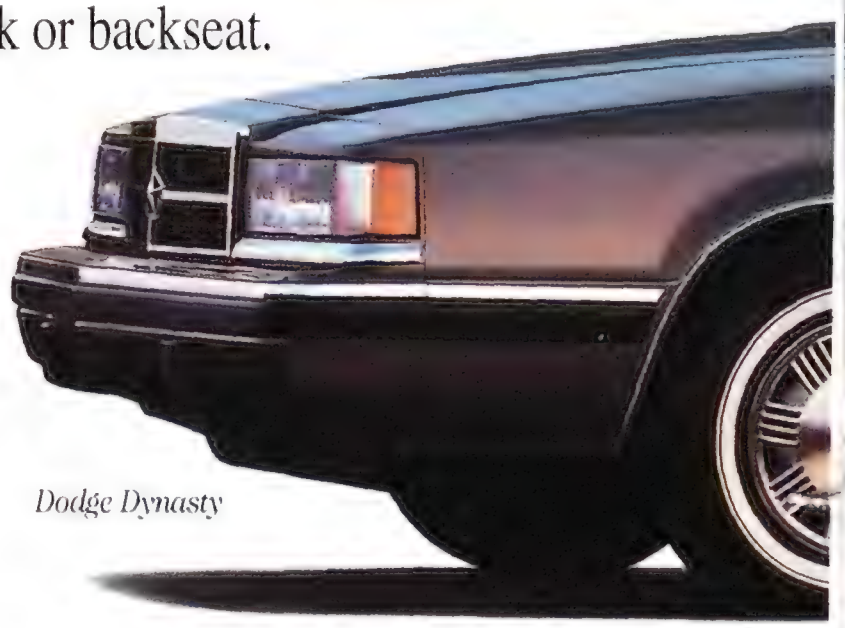

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Witness to the life-and-death struggles of the seals, a fairy tern hovers above beach on Hawaiian archipelago.

By Charles Bergman

Rescuing Hawaii's 'brine children' with a Head Start

Endangered monk seals may survive thanks to new programs to preserve their habitat and protect young from attacks by adult males

I was walking along the white-coral beach of a tiny atoll. Great frigatebirds soared high above the tropical seas, their scissored tails and angular, pointed wings giving them a vicious beauty. From their exposed nests on the hot sand, noddies with fudge-colored plumage scolded me in raspy honks; their babies had squeezed under their bodies to escape the glaring sun. Suddenly, behind me, I heard an unmistakable *pong-pong-pong*. Hovering just inches above my head was an exquisite fairy tern, its black eyes stunning against its blazing white body, and the blue sky visible through the translucent white of its beating wings.

The waters of the turquoise lagoon before me were almost blindingly beautiful. Not far away a female seal napped with her young pup in the shallow water near the beach. The tiny, jet-black pup cuddled against its mother, cheek by jowl, like her shadow.

Then, the peacefulness of the morning was blown apart. Roused to fury, the female seal charged into the water. She lifted her immense body into the air with a surprising power, landing with an anguished bellow. Prismatic sheets of water sprayed from her on all sides. Her howls were horrifying.

A big bull seal looking for a prospective mate had dared to come too close. The sleeping mother—whose life was focused on rearing her pup—exploded from her nap in a protective frenzy. As she plunged through the water, jaws wide and snapping, she lunged straight for the male's head, rocking him backward with a violence that put him completely on the defensive.

Juvenile hauls itself up on the beach, apparently unafraid of the photographer. These seals almost became extinct in the 19th century because their extreme tameness made them easy prey for fur traders.

He threw his head back, and, trying to fend her off with his small foreflippers, waved them futilely at her 500-pound bulk. The cow just kept coming at him, implacably. For a moment, I thought she was going to kill him.

She attacked several times, each time driving the male out into the deeper water of the lagoon. But he always returned. After each attack the pup swam closer to its mother. She would turn toward it and touch it nose-to-nose. They showed great affection for each other, the pup bleating and the cow responding with a deep moaning sound. About half an hour later, mother and pup hauled themselves back onto the beach. Finally, the male gave up and disappeared into the lagoon. The female gave a few more threats—snorting and huffing feints. Fortunately, the mother of this pup was adequately matched to the threat of the bull.

This scene was played out on Kure Island, a place for anyone with an imagination that can be piqued by extremes. During two weeks there, I felt as if I were on a far edge a long way out at sea. Barely one and a half miles long and a third of a mile wide, this atoll is the remotest of the Hawaiian islands. Kure Island lies in the Pacific Ocean, 1,350 miles past Honolulu, at the northwestern end of the Hawaiian archipelago. Biologists from the National Marine Fisheries Service (NMFS) in Honolulu have established innovative programs on Kure to save the endangered Hawaiian monk seal, *Monachus schauinslandi.* One project, called Head Start, is focused on protecting female pups against attacks from male seals and sharks, both of which have become a threat to the future of the species.

The bond between the mother seal and her young, I recently learned, is extremely important. Unlike other seal species, which have short, well-defined breeding seasons, monk seals have a long pupping and mating season. For the Hawaiian species, it lasts about six months, from February through July, with births occa-

Photographs by Charles Bergman and Frans Lanting

Mother seal (center) confronts an aggressive, mate-seeking male, while her pup swims close by (opposite).

sionally reported in other months. After giving birth, the mother is completely devoted to her pup—she never leaves, even to feed. Instead, she fasts for the 40 or so days of nursing, during which she loses considerable weight. Over this period the pup grows from 35 pounds at birth to 140-200 pounds. Perhaps this bond is so strong because the nursing pup is so dependent on the mother. At weaning she deserts the pup, leaving it on its own to survive.

Stretched out on a sandy beach, napping Hawaiian monk seals like the cow and pup are the image of self-absorption: their sleep seems profound; they seem lost in their pinniped dreams. Despite their aggressive reactions when threatened, most of the time they appear tame, oblivious, serenely and supremely imperturbable. They remind me of big sea-Buddhas. Pregnant Hawaiian monk seals, however, are extremely sensitive to the presence of humans and will seek less than adequate habitats in attempting to rear their pups on undisturbed beaches. In addition, human harassment threatens the mother-pup bond. In past years at Kure, females have tried to avoid people by giving birth on small, less than perfect islands that form part of the atoll. The result has been high pup mortality. Confrontations like the one I witnessed on Kure are probably much less threatening than humans to a mother seal, who can usually resolve such bouts in her favor. Disturbances from humans and, to a lesser degree, from aggressive male seals are the reasons why, while I was on Kure, this one mother and pup were the *only* nursing pair on the atoll.

Since 1976, Hawaiian monk seals have been officially listed as endangered. Though they are occasionally seen near the main islands, their range is largely restricted to the remote reaches of the more isolated northwestern Hawaiian islands. There they find the uninhabited atolls and secluded sandy beaches particularly attractive for hauling out and pupping. All but Kure and the Midway Islands, the most distant of these, are part of the federal Hawaiian Islands National Wildlife Refuge, which stretches from Nihoa Island to Midway. Kure, on the other hand, is part of the state sanctuary system. The Midway Islands do not even belong to the state of Hawaii, but are administered by the U.S. Navy. Within the federal and state refuges, boating is restricted, and permits are needed for anyone wanting to go onto the islands. Because of their remote habitat, Hawaiian monk seals are almost invisible; few people realize they exist, and even fewer people ever see them.

Actually, there are three species of monk seal, all fascinating and all endangered. Monk seals are found in the world's tropical oceans, though their evolution began in the North Atlantic. The Hawaiian monk seal is believed to have separated from its ancestral Atlantic stock at least 15 million years ago, swimming into the Pacific Ocean through what was then the Central American seaway. Since that time the species has changed little, retaining many anatomical features that cause it to be characterized as a "living fossil." The other two species, the Mediterranean (*Monachus monachus*) and the Caribbean (*Monachus tropicalis*),

Author Charles Bergman, a professor of English at Pacific Lutheran University in Washington, is writing a book on men's experiences in nature.

Monk seals have uniquely long breeding season; males seek partners at same time females nurse their young.

followed somewhat separate evolutionary paths in the Atlantic. While the three species evolved separately, they all evolved in habitats lacking any significant terrestrial predators. Thus, animals that were not pregnant or nursing had no real need for a flight response or wariness of animals—including club-bearing humans—that approached them by land. This "genetic tameness," as one expert termed it, has led to the downfall of all three species.

Homer mentions seals in the *Odyssey*, giving them one of his sweetest epithets: "brine children." Presumably he was referring to Mediterranean monk seals. This species, once prevalent throughout the Mediterranean, is now found only in remote caves and beaches, barely surviving the intense human pressures of the region. Current population estimates—guesses, really—put the remaining number of these seals at fewer than 500. The extreme political complexities of the area make recovery efforts difficult and put the future of the species in doubt.

The Caribbean monk seal was first noted by Christopher Columbus in 1494, during his second New World voyage. It was widely killed for skins and oil, and, according to one chronicler, by 1887 had become an "almost mythical species." Though still officially listed as endangered, it has not been reliably reported since 1952. It is probably extinct.

Thus the Hawaiian monk seal may well be the only one with any real chance of surviving. When the NMFS monk seal recovery program was established in 1980, William Gilmartin was appointed its leader. He came to the project with 13 years of experience in working with wild and captive marine mammals. Gilmartin's introduction to Hawaiian monk seals occurred in 1978, when he helped investigate a die-off of seals at Laysan Island. His findings suggested that ciguatera was the cause. (This disease phenomenon results from a toxin produced by a marine protozoan. Predators far up the food chain, such as seals, are usually hardest hit, as they build up large concentrations of the toxin.)

I met Gilmartin at his research facilities in Honolulu, where he was studying the reproductive behavior of adult male monk seals. His ongoing work with mothers and pups, and now aggressive males, is an example of the new forms of active biological intervention increasingly required to save severely endangered species like the black-footed ferret and California condor. A tall, thin man, Gilmartin speaks thoughtfully, deliberately: "When we started, the first priority was to do something about Kure. We knew it was becoming critical."

Problems for the monk seal began in the 19th century, when sealers killed the animals by the thousands. Before World War II the U.S. Navy established a base on the Midway Islands, just 50 miles from Kure, and the Coast Guard built loran stations there and at French Frigate Shoals. Human interference in the habitat of the Hawaiian monk seals created the problems that Gilmartin's recovery program had to find ways to solve.

Pups were dying at an alarming rate

Human encroachment particularly affected mother seals. Cows were forced to give birth and to raise their pups at sites where they were more vulnerable. Mothers and pups also spent more time in the water, where they were exposed to attacks from aberrantly aggressive bull seals (a phenomenon still not fully understood). Pups with large wounds from adult males have been observed at Kure. The young seals are traumatized by these bites and often get infections, sometimes dying from superficial injuries. The wounds also leach fluids, attracting sharks that cruise the shallow waters of lagoons in the late spring and summer.

The death of young seals became such a serious problem that, as early as 1968, William Wirtz, a biologist with the Pacific Ocean Biological Survey Program (sponsored by the Smithsonian), identified low pup survival at Kure as an immediate danger to the species. During his research over two summers, Wirtz found that of the 62 pups born on Kure, all but one either disappeared or were killed between the ages of 16 and 74 days.

From the late 1950s to 1980, pup deaths were the primary cause of declining seal populations at Kure

and Midway. New animals were not entering these populations as the older seals died. In addition to the direct loss of individuals, the future breeding population was eliminated. Ten years ago, the Hawaiian monk seal population at Kure was considered geriatric. The same females kept having babies; they were growing old, becoming less fertile and eventually dying. As the older females died off, there weren't any young females to replace them and perpetuate the population. In the late '50s, about 30 pups were born each year on Kure. By the late '70s, births were down to 10. Between 1982 and 1985, births steadily dropped to 3 to 5 pups annually. In 1986, only one was born.

The first job for the recovery program was to "define the political realities and biological possibilities," says Gilmartin. In order to protect the seals, NMFS solicited the cooperation of the Coast Guard. The beaches on the north end of Kure, where many of the remaining seals congregated, were declared off-limits, and no one was permitted to go within 100 feet of the pinnipeds. But the seals required even more help. Says Gilmartin, "We began Head Start because we had nothing to lose; the pups were still dying."

In 1981 the recovery team built a 100-foot-square enclosure on the beach; it extended out into the lagoon like a large marine corral. Every spring, as soon as the female pups were weaned, team members captured them and put them in the enclosure until September. As Gilmartin explains, "The pen protects them from being attacked by male seals and sharks during that first crucial summer, when they are most vulnerable."

Later in the '80s, any beach occupied by a nursing mother and pup was temporarily placed off-limits. The Coast Guard helped in official ways by flying the biologists back and forth to Kure in huge C-130s. Unofficially, but perhaps most important, says Gilmartin, the personnel stationed there also volunteered to help the biologists with the work of counting, weighing, tagging and feeding the seals. "They worked with us and came to see the importance of what we were trying to do. The members of the Coast Guard on Kure can take credit in helping to save an endangered species."

The decline in the number of monk seals at Kure had been so severe that Gilmartin feared Head Start alone would not save the population. In 1984 his staff also collected some prematurely weaned seals at another site, French Frigate Shoals. These underweight females were flown to Honolulu, rehabilitated, or fattened, over the winter and then released as yearlings on Kure beaches.

Mother seal sleeps with pup; it will nurse for five to six weeks, quadruple in weight from 35 to 140 pounds.

Head Start graduates released to reproduce

Though the number of births continued to decline until 1986, Head Start was successful in saving female pups born after 1980. Of the 51 female seals from Head Start and the rehabilitation project that have been processed and released on Kure, 41 were alive at the end of the 1991 field season.

Even more significant, many of these females have reached sexual maturity (5 or 6 years of age) and are beginning to reproduce. So 1986 was the nadir. Six pups were born in 1987, another 8 in 1988 and 11 in 1989. In 1990, the number dropped to 7. Gilmartin says the drop was due to some large and as yet undetermined environmental stress throughout the Hawaiian islands that affected other species as well. Births were up again this year, with 14 new pups, the highest number since the mid-'70s.

While I was on Kure, four young females—"wean-

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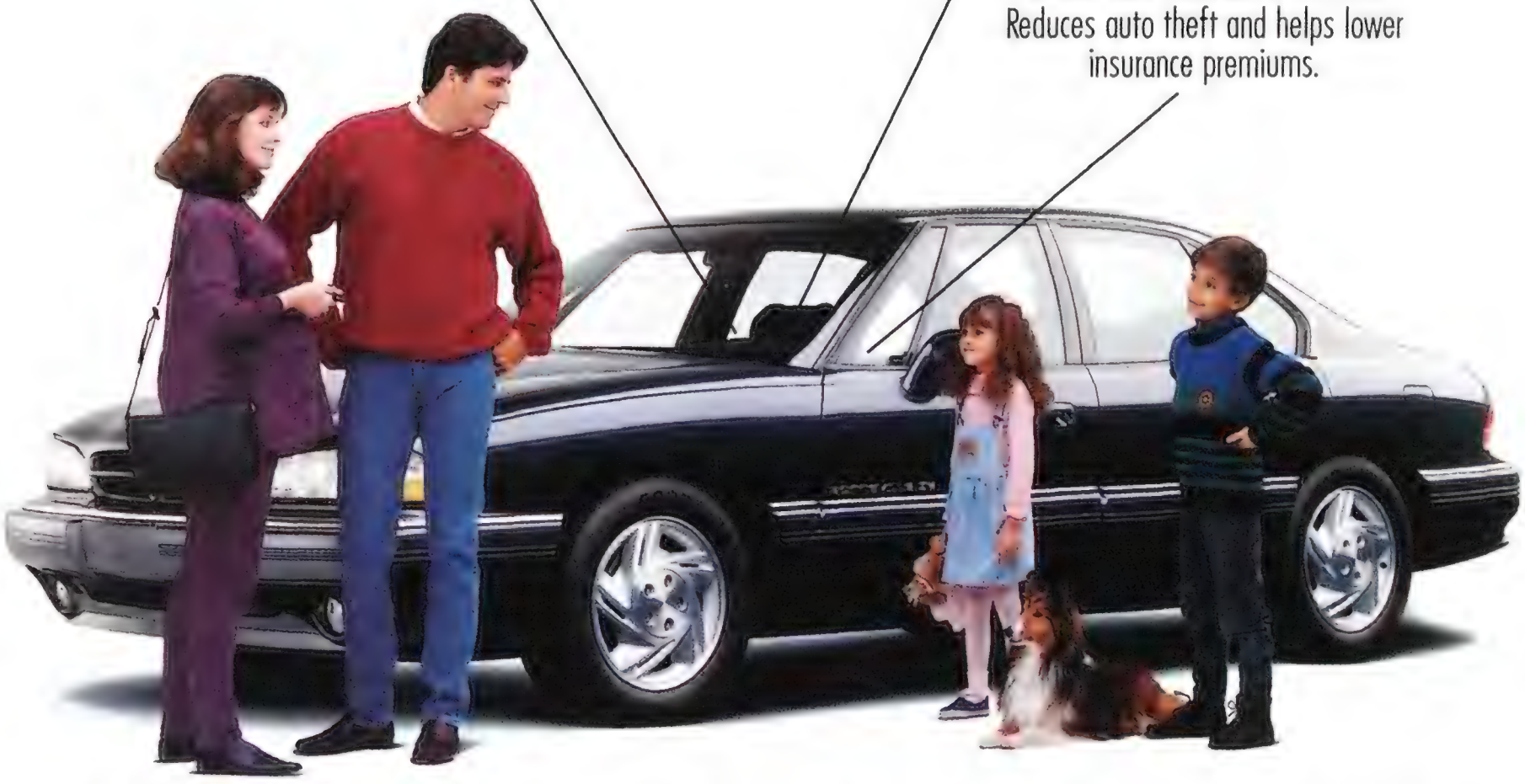

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Seal pup keeps close to mother, totally dependent on her for whole nursing period. The female never leaves her young's side, even to feed, fasting until, eventually, she weans pup by leaving it on its own.

ers," we called them—were in the enclosure. The researchers and I fed them fish and lobsters that we caught in traps. We also scrubbed down the pen. While the job was drudgery, there was a wonderful payoff: we could swim with the seals.

My first time on the job I grabbed a broom, squished my face into a snorkling mask, high-stepped across the sand in flippers and headed for the marine corral. I felt as absurd as a character in a children's story about to try to sweep the sand off the ocean floor. A brown booby sat like a dark sentinel on one of the posts that held up the wire fence. When I started brushing algae off the fence, I found myself swimming through a cloud of green slime filled with hundreds of feeding minnows; their bites felt prickly against my skin.

One of the young females, the largest, cruised nearby, watching me while I worked. She was only a few months old and already weighed 130 pounds. She edged closer, cautiously sizing me up. Soon, two of her penmates joined her, and I was ringed by the three seals. Old seals have brownish gray fur, except after their annual molt, when their coat is silver. Young weaners, like the ones I was swimming with, have that same beautiful silver coat. Their bodies bulged in sleek contours from flipper to tail, and the clear water of the lagoon made their fur look like wet mirrors. They approached me, their bright faces bobbing above the water, their round eyes wide open. I was struck by their flaring, snorting nostrils.

I kept my back to the fence so I could keep my eye on them; as they dove and circled around me, I often lost sight of one or two. They closed in slowly, with a wonderful, insidious grace. Soon they were all over me, their short fur rubbing against my skin. Their playful energy was impossible to control. The biggest was especially bold and would dive to the bottom, and float with her head at my feet and her tail flippers dangling above the water like limp dishrags. She chewed on my plastic flippers. Monk seals have powerful jaws, and when they go after fish they use strong suction to pull prey from small openings in coral reefs. When the big female started sucking on my leg, the sensation was startling.

The seals played with the broom handle, even as I used it to push them away. They would wrap their foreflippers around it and stuff it in their mouths, all the while their bodies colliding with mine. It was unbelievable—finding myself so far out in the Pacific Ocean, on a tiny atoll, being discovered and explored by the seals.

More typically, my exchanges with the monk seals took place on the beaches, where they hauled themselves out for naps. Three times a week I joined the other members of the research team and hiked the circumference of the island to take beach counts, usually in the heat of the afternoon, when the largest number of seals came ashore. We categorized them by size, age and sex. We often counted 25 to 30 seals, and

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Laysan albatross may pester pups as it wanders among naupaka, a shrub under which seals often shelter.

happily many of them were juveniles. Gilmartin's research has shown there are about two and a half times as many seals in the total population as we could find on any day on the beach, so the number of seals on Kure was probably 60 to 75. Still, that is only about one-fourth of the total found on the atoll in the late '50s. Based on a careful census of all seals at Kure in 1990, Gilmartin put their population at 74.

Much remains to be learned about the Hawaiian monk seal. There was a large drop in the number of seals on Lisianski Island, Pearl and Hermes Reef, and Laysan Island over the same years that the Kure population declined. Unlike Kure, these islands were not similarly occupied by people, but access to them was not controlled as it is today. The human disturbance factor is therefore an unknown. Another possible reason for the decline may be ciguatera. The toxin is thought to be responsible for the deaths of at least 50 seals on Laysan in 1978.

Another serious and growing problem in the waters of the northwestern Hawaiian islands, as in all the world's oceans, is marine debris. Even though the recovery program staff has been cleaning the beaches of all the breeding islands since 1982, more seals have been found entangled in fishing nets and lines than ever before. Weaned pups—those most important to the future of the species—have been found caught in the debris at rates considerably higher than their proportion in the population.

Gilmartin has also begun innovative research to study the "mobbing" behavior of the adult male seals. "Mobbing" is the term used to describe bull seals in mass mating attacks, when anywhere from a few to more than 20 aggressive seals at a time descend on, and often injure or kill, adult and immature females. As Gilmartin says, "It's a phenomenon we don't really understand very well. It occurs primarily at Lisianski and Laysan islands, where the adult populations are skewed as much as 2 or 3 to 1 in favor of the males." He believes it may be an all-out mating strategy used by males which, if they approached a female singly, usually would be driven off.

Mobbing-related deaths of adult females are so common that Gilmartin believes "these two island populations cannot recover to their former levels unless the behavior is controlled or the males are removed from the area." In bad years, so many mature females are killed that they can't be replaced by younger females just old enough to reproduce. "It's impossible for these populations to bounce back under current conditions," Gilmartin says. "We are being cautious, and our research is being directed at enhancing female survival and population growth by controlling male behavior. But I believe the long-term solution will probably necessitate physical removal of the most aggressive problem males." The result of such measures would mean the survival of more females and pups—and a chance for seal populations at Laysan and Lisianski to begin recovery.

Controlling the sex drive of aggressive males

Gilmartin is also hoping to chemically eliminate the most aggressive behavior of some males from one population for a season or two. With four adult male seals—each with a history of mobbing behavior—in captivity at Sea Life Park on Oahu, he has shown that he can suppress their testosterone levels. With an experimental drug, he has been able to decrease production for several months. Gilmartin believes that lower concentrations of the hormone should result in a diminished sex drive. He hopes this will prevent overly aggressive males from participating in mobbing attacks for an entire season. He has not yet had a chance to test the drug in the wild, to see if the altered testosterone will lessen the aggressive behavior.

The results of these new programs are exciting, but there is still more work to be done. Head Start will continue on Kure through 1992, when the Coast Guard

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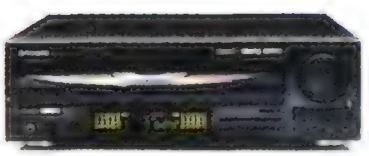

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Without young, monk seal is trusting, "genetically tame"; species evolved in area with no large land predators.

Wire fencing marks marine corral built by biologists to protect "weaners" from aggressive bulls and sharks

station is scheduled for closing. "With everyone off the island, it will be great for the seals," Gilmartin says, though the recovery work will continue at other islands.

Successful management of the Hawaiian monk seal is also aiding recovery efforts for the more endangered Mediterranean monk seal. Head Start and the rehabilitation project are being used as models for future European programs. Research on Hawaiian monk seal reproductive behavior may also provide critical information for a Mediterranean captive breeding program. In addition, Gilmartin and European scientists have recently used captive Hawaiian seals for evaluating the efficacy of a new vaccine that may protect Mediterranean monk seals from a deadly virus that has killed thousands of seals (of other species) in the North Atlantic. According to Gilmartin, "Such cooperation is very important. I believe we have an obligation to use our knowledge and resources to assist with the recovery of the Mediterranean monk seal."

Watching a mother-and-pup comic shtick

My time on Kure eventually came to an end. Of all the images of the seals that I recall, the most powerful are those of the mother seal and her pup. I loved to watch them in the evening as they swam in the surf, then clambered across the hundred feet of white beach to their nightly sleeping spot. One evening stands out in my memory. I was taking my usual walk along the beach, which stretches down a gentle slope to the lagoon. I stayed near the edges of the beach naupaka, a bushy shrub that chokes the island in a chest-high tangle. It has flat, thick leaves and tiny white flowers. Black-footed albatrosses sat along the edge of the water, young ones. They were learning to fly and took long, running starts and landed on their chests with a crashing, stumbling thud. Laysan albatrosses hung out with them, but most of these white-and-black birds clustered up among the gnarled stems of the naupaka. Christmas and wedge-tailed shearwaters emerged from the brush, veering through the dusk on long, bladed wings, filling the air with their cries. As night fell, red-footed and masked boobies streamed back into the underbrush, wrapping their webbed feet around the branches. I saw a bristle-thighed curlew chasing ghost crabs on the beach. The crabs were too small to see, and it looked like the curlew was simply running amok in erratic circles on the darkening sand.

Standing quietly, surrounded by thousands of miles of water, I could see the female monk seal and her pup still swimming in the water. This was an unhurried evening ritual for them. The mother and pup did a sort of comic shtick when they finally struggled up the beach. The cow led the way, keeping in touch with the pup by calling out softly in a low moo. The pup

barked back. Periodically the mother would lie still on the sand, an inert hulk, blubber spreading and flattening out as she gathered strength for her next push. Her lively eyes peered out of a face that seemed ludicrously small on the mass of her body. Then, shaking all over like a massive water balloon, she suddenly surged ahead, about five to ten feet—flippers slapping the sand, chin grabbing the ground for traction, head pushing desperately forward. Another rest. Another surge. With determined effort she chugged on, leaving a shallow trail in her wake.

All the while, the pup waged a rearguard guerrilla attack on its mother. With startling agility, it ambushed her tail flippers. Then, climbing over her back, the mischievous pup attacked an unsuspecting foreflipper. Next, in a virtual gallop, the pup raced ahead and brought the mother seal's slow progress up the beach to a halt by lying directly across her path. The mother showed no sign of impatience. It took the two of them about 20 minutes to climb the beach to the naupaka. They frequently slept in exactly the same spot at night.

The pup was only about two and a half feet long. I watched its fur dry to a rich, velvety black. Sand, forming two rings of white, clung to a secretion around its blue-black eyes that keeps them clean; otherwise they were hidden in its face. The mother rolled onto her side under the naupaka, exposing a cream-colored belly and four nipples. The pup nursed briefly, twisted onto its back, flippers across its own full belly, and napped like a kitten. Waking, it crawled up to its mother's face, squirmed under her chin and stretched out in lazy satisfaction. They made intimate little noises to each other, the mother laying her chin across the pup's back. At one point, a Laysan albatross waddled in to try to peck the pup. A goofy-looking juvenile with crossed eyes and dark down on its head, like a punk haircut, it was gawky and aggressive. An albatross with an attitude. The mother bellowed and yelled, terrifying the bird and sending it sprawling backward onto its tail in a silly retreat.

The pup stayed under its mother's chin, rolled onto its back again and gave her face a flippered embrace. Then its little mouth and white lips came ajar, curling into a self-satisfied smile, an enigmatic smirk that revealed its pink mouth and throat. The mother's lidded eyes drooped; she looked blissfully mindless. What I saw in the dreamy pleasure of the pup and the fierce, tender affection of the mother was a glimpse of absolute contentment.

In island shallows, a Hawaiian monk seal munches on fish; seals also relish octopuses, eels and lobsters.

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Art imitates life in the small world of Baroque crèches

Diminutive 17th- and 18th-century Neapolitan figures almost come alive in the collection deftly assembled by a pair of Louisiana artisans

Collector-craftsmen Frank Hanley (left) and Jeffery Guéno frame dazzling display of Neapolitan crèche art. The figures and costumes are antique; settings are reproduced by the two men using authentic materials, special aging techniques, and tricks such as spider webs and bonsai limbs. Detail (opposite) is of Holy Family.

One of the best-kept secrets in Lafayette, Louisiana—the hub of Cajun culture—is not, it seems, a new recipe for chicken gumbo or the latest hybrid azalea. It is an outstanding collection of Baroque Neapolitan crèche, or *presepio*, art, one of the finest and most extensive in the country. The cache is the passion and pride of partners Frank Hanley and Jeffery Guéno, whose talents and shared interests—in miniatures, antiques, art, design and collecting—have enabled them to assemble this remarkable display.

In 17th- and 18th-century Naples, the celebrated *presepio* was the hobby of the age. These elaborate miniature crèches were set up at Christmastime in the homes of royalty, nobility and the wealthy bourgeoisie. A stylish "toy" that served to display not only piety, but culture, wit and wealth, the *presepio* was also an acknowledged art form that encompassed many aspects of Neapolitan artistry—from painting and sculpture to scenic design and fashion. A beguiling blend of reality and fantasy, these scenes represented both the sacred and the profane. The Holy Family invariably held the place of honor, along with the royal procession of the

Photographs by Philip Gould

Meticulously executed, these tiny reproductions of antique porcelains and faience testify to the level of Hanley and Guéno's craftsmanship. The two produce these precise replicas for museums and collectors.

Attendant to Magi and page, at far left of main scene (p. 101), are resplendent in gold-embroidered silk.

Magi. But alongside these traditional scenes appeared a variety of genre vignettes, such as the scene at the inn (p. 104). It was this insistent, penetrating portrayal of contemporary life that distinguished the Baroque Neapolitan crèche.

Crafted by some of the most distinguished sculptors of the day, the puppetlike figures that peopled these scenes were notable because of the expressive, life-like rendering of their terra-cotta and wooden heads. Bodies were usually made of hemp or oakum wrapped around a framework of iron wire that allowed for variation in pose. Ranging in size from about 8 to 18 inches, the figures were clothed in authentic dress of the time and accompanied by a rich variety of accouterments—from silver censers to baskets of wax fruit. The intricate settings were built primarily of cork, wood and plaster, and generally incorporated elements of the landscape of southern Italy. Little remains of these fragile scenes, and over the years figures and accessories have been scattered piecemeal around the world.

It's a long way from 18th-century Naples to the sultry bayou country of south Louisiana. But in Hanley and Guéno's stately home in downtown Lafayette, the Neapolitan crèche collection, begun some 20 years ago with the purchase of a single shepherd, takes center stage. The figures and accessories are 17th- and 18th-century. The settings have been painstakingly reproduced by Hanley and Guéno from drawings, archival material and scenes in prominent collections. Their artfully rendered tableaus attest to the exactitude of their research and craftsmanship, and document a splendid period in Neapolitan culture and society.

Diane M. Bolz

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Detailed scenes of everyday life, such as this at the inn, were characteristic of Neapolitan Baroque crèche art.

Figures and accessories are 18th-century; architectural elements are re-created in carved, painted cork.

Still life of terra-cotta and wax vegetables reveals remarkable concern for detail by artisans of Naples.

Close-up of table from the inn (above) holds petite 18th-century shells, wax prosciutto on majolica plate.

Seventeenth-century Spanish Madonna praying over Christ Child is a foot tall, made of wood, painted canvas.

Inveterate collectors, Hanley and Guéno have amassed a trove of antique crèche art that spans the globe.

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By Lionel Casson

Imagine a time when oil was only a nuisance

For thousands of years in the Middle East it was messy and useless stuff, of interest mainly to a few Greek and Roman tourists

Today Middle Eastern oil is "black gold," something people seem ready to go to war about. It was not always thus. Quite the reverse. For most of the thousands of years that oil has been oozing out of the sandy surface of Middle Eastern countries, it was seen at worst as useless, at best as a tourist attraction. And very likely it was regarded as a terrible nuisance by Mesopotamian and Persian mothers whose kids tracked the dirty, smelly stuff into the house.

Oils range from light crude, which flows easily, to heavy, gloppy crudes, and so on to the semisolid form of petroleum we call asphalt. Mixed with natural gas, oil lies underground. But because Earth's surface sometimes shifts and cracks, the oil sometimes oozes up, collecting on the ground in pools. In the Middle East, atop the world's richest reserves, such seepages go back to prehistoric times. It was only in 2000 B.C., however, that they first made their appearance in written records. When Greeks and Romans began traveling through the Middle East, the black pools became one of the region's great tourist attractions.

Among cuneiform tablets dating from 2000 B.C. Babylonia—today the southern part of Iraq—is one that uses the word *naptu*. Etymologically the word means "that which flares up," and its occurrence in any number of later tablets proves beyond question that it was the native term for crude oil. On the lips of Greek visitors *naptu* was transformed into *naphtha*, which English subsequently borrowed from the Greek.

The only way the Babylonians had of becoming acquainted with the stuff "which flares up" was by stumbling upon seepages. To most people living near a seepage it was known as bad medicine and a sure sign of bad luck. "If in a certain place in the land *naptu* oozes out, that country will walk in widowhood," states one cuneiform text darkly. "If the water of a river bears . . . oil, want will seize on the peoples," states another. "May donkey urine be your drink, *naptu* your ointment" was one way of putting a curse on an enemy—a way that seems to have overlooked the fact that crude oil had some virtue as an ointment. Some people used it to treat their animals' skin diseases.

In the fifth century B.C. Herodotus reported on a famous spot in Persia, at no great distance from the oilfields of Kuwait that Saddam Hussein lately set afire, where both oil and asphalt oozed from the ground. Salt, too; the combination is not uncommon. The keen-eyed Greek—who is honored as the father of history but deserves equal credit as father of the travelog—made a special side trip to have a look at it. What he described sounds very much like the first oil well that we have on record.

The locals, Herodotus noted, had dug into the seepage and rigged up a horizontal pole, balanced on an upright, to the end of which "is attached . . . half a wineskin. A man makes a dip with this, draws the liquid up, and then pours it off into a receptacle. From there it passes into another, where it turns into three different shapes: the salt and asphalt solidify right away, while the oil they collect in clay containers." He was talking about crude oil, for he added, "it is black and has a strong smell."

Greek and Roman visitors were particularly bowled over by asphalt. The sheer volume of the deposits, the size of some of the chunks, impressed them. "Of all the marvels to be seen in Babylonia," marveled Diodorus, a Greek historian who wrote toward the end of the first century B.C., "the most amazing is the mass of asphalt that is produced there. . . . Uncountable numbers of peoples have drawn from it, as from some vast spring, yet the supply remains intact."

One of the biggest concentrations was at Hit, on the Euphrates, less than a hundred miles northwest of Baghdad and no longer significant to Iraqi oil production. Herodotus remarked on the multitude of asphalt clods the place produced. And 2,000 years later, travelers were still waxing rhapsodic about it. A Venetian merchant named Cesare Frederici visited it on his way to India in 1563. "Nere unto the river Euphrates there is a city called Heit," runs his account, as Englished by an Elizabethan translator, "nere unto which city there is a great plaine full of pitch, very marvellous to beholde, and a thing almost incredible, that out of a hole in the earth, which continually throweth out

"On the lips of Greek visitors *naptu* was transformed into *naphtha*, which English subsequently borrowed."

Illustrations by Keith Bendis

When oil was regarded as useless

"This pitch is throwen with such force, that being hot it falleth like as [if] it were sprinckled all over."

pitch into the aire with continuall smoake, this pitch is throwen with such force, that being hot it falleth like as [if] it were sprinckled all over the plaine, in such abundance that the plaine is alwayes full of pitch: the Mores and the Arabians of that place say, that that hole is the mouth of hell."

Our word "asphalt" derives from a Greek term that owes its origin to the Babylonian bricklayers' practice of using asphalt as mortar. Greek visitors to Babylonia, who had never seen bricks laid in anything but a mortar made of lime, were so intrigued by this unexpected substitute that they dubbed it *asphaltos*, meaning literally "non-fallen"; to them, what was so special about it was the way it helped keep a wall upright. It turned out to be perfect not only for bricklaying but also for waterproofing bathroom walls, drains, gutters and even river embankments.

If asphalt impressed Greek visitors, naphtha—liquid crude—absolutely astounded them, especially the hair-trigger way it had of bursting into almost unquenchable flame. Strabo, a Greek geographer reporting at the start of the first century A.D., notes that "if naphtha is brought near a flame, it catches fire, and if you smear some on the body and come near a flame, the body will catch fire. It cannot be quenched with water—it just burns harder—unless a whole lot is used, but it can be smothered and quenched with mud, vinegar, alum, or birdlime." (A millennium and a half later, Jesuit missionaries, coming across a crude oil seepage in what is now western New York State, had exactly the same reaction as Strabo—sheer amazement at a "stagnant thick water that ignites like brandy, burning with bubbles of flame when fire is tossed into it.")

"The street was one continuous flame"

In 331 B.C., when Alexander the Great marched into Babylonia, he was shown a veritable lake of naphtha. Plutarch, who reports the incident, goes on to describe naphtha as "being so sensitive to fire that, even before a flame touches it, it catches fire from the very radiance of the flame." He then tells how, toward evening, the locals put on for Alexander the nearest thing to a fireworks display that the ancient world was capable of. They splashed a trail of spots of naphtha all along the street leading to his quarters. Then they stationed themselves at the farther end and, when it got dark, touched a torch to the beginning of the trail. "As soon as the first spots caught fire," writes Plutarch, "the blaze spread with no discernible interval of time; with the speed of thought it leaped to the other end. The street was one continuous flame."

But it was only visitors who were intrigued by naphtha. The people who lived with it often regarded it as a menace. This evil repute continued right on through

"One area in which this unwanted stuff proved welcome was the field of warfare. . . . As time went on, naphtha came to play an important role in the manufacture of higher-tech fire missiles."

the Middle Ages, when God-fearing Christians considered naphtha the sort of stuff that only demons would monkey with. A case in point involved a demon that installed itself as a squatter in the ruins of a pagan temple that Saint Nicholas had once piously demolished. When the saint evicted the intruder, the demon—to get even—assumed a woman's form, approached a group of pilgrims who were boarding ship for a voyage to Nicholas' grave and handed them a jar of what they thought was olive oil, telling them to use it for filling the lamps of the saint's church. The jar, needless to say, contained naphtha. But not to worry. Saint Nicholas promptly appeared in a dream to a member of the group and instructed him to heave the jar overboard; when he did so, in the nick of time, the whole sea burst into smoke and flame.

"Its inflammable nature, so closely related to fire, puts it far from being of any practical use," the Roman polymath Pliny pontificated in the massive encyclopedia he compiled. But one area in which this unwanted stuff proved welcome was the field of warfare. In the seventh century B.C., when Esarhaddon, ruler of Assyria, was attacking the town of Ubbume, he built a ramp up to the top of the wall encircling it. Thereupon the defenders "in the dead of night sprinkled *naptu* all over the ramp and set fire to it." Luckily for Esarhaddon—or so his scribe claimed—"at the command of Marduk, king of the gods, the north wind sprang up . . . and turned the tongues of flame right around against the town." The thirst for destructive power being what it is, naphtha began making its mark on the world. As time went on, naphtha came to play an important role in the manufacture of higher-tech fire missiles. The ancients had formerly made these by swathing spears or arrows with an absorbent material soaked in anything that would burn easily, generally pitch or resin. Naphtha, it turned out, was ideal for the purpose.

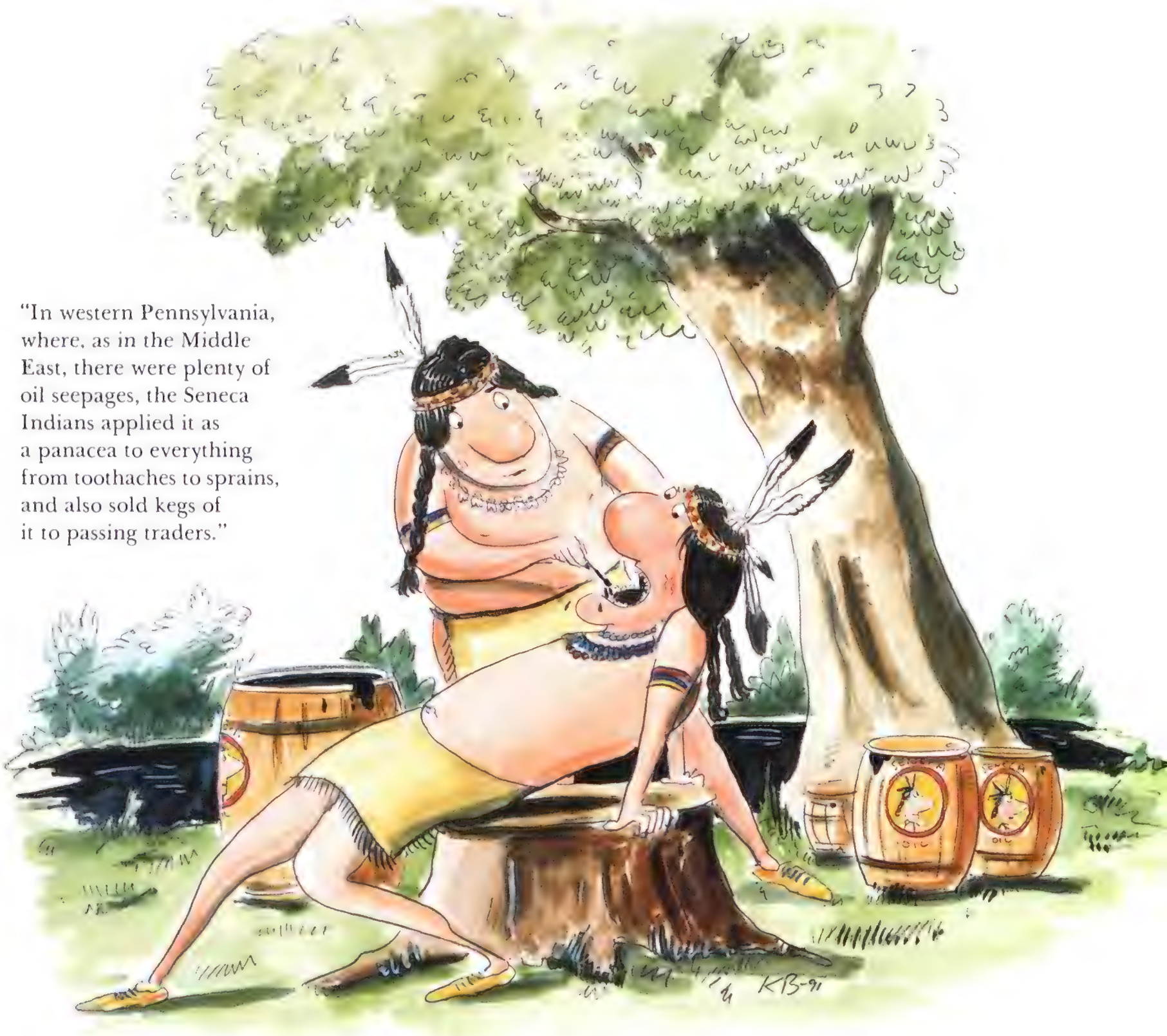
At some point—precisely when is hard to determine—the manufacturers of fire missiles realized that even better results could be achieved by lacing naphtha with sulfur or quicklime. There followed a further key discovery: by adding saltpeter, they could get a mixture capable of spontaneous combustion. This concoction—known as "Greek fire"—is often credited to a certain Callinicus, a technical expert working in Constantinople, the eastern capital of the Roman Empire, during the years A.D. 673 to 678, when squadrons of Arab warcraft annually sailed up to attack the city. The fire weapons that he devised not only enabled the defenders to destroy Arab fleets again and again, but for centuries managed to insure the Byzantine navy's command of the sea. Byzantium's men-of-war were equipped with catapults to fire naphtha grenades onto the decks of approaching enemy craft; they also carried big flamethrowers—cannonlike tubes fitted with a pump and loaded with a naphtha compound—to pump sheets of flame at enemy ships whenever they

Historian and classics professor Lionel Casson writes frequently for SMITHSONIAN. *His basic study* The Ancient Mariners *has just been revised and reissued.*

tried to close and board. In naval weaponry naphtha was state of the art.

It was not until the 14th century, when an efficient gunpowder was developed, that naphtha's days of explosive glory came to an end. The only use found for it was medical: it made a good ointment. Marco Polo reports it as being effective for treating camel mange. In the form of petroleum jelly, people still put naphtha on skin irritations. In western Pennsylvania, where, as in the Middle East, there were plenty of oil seepages, the Seneca Indians applied it as a panacea to everything from toothaches to sprains, and also sold kegs of it to passing traders. By the early 1800s practically every household within the Keystone State had a bottle of Seneca oil on the cupboard shelf. Eventually, even the pharmacies in New York City began stocking it.

The transformation of crude oil from a dubious panacea, at a level somewhere just above snake oil, to something the modern world is all too ready to kill for, did not begin to occur until the mid-19th century, hardly more than a hundred years ago. That was when improvement of refining techniques turned it first into kerosene for lamps, and later, in the early 1900s, into gasoline for what would be billions of internal combustion engines. When supplies started to run short in the New World, the Old World was tapped—until *naptu* gushed in dark torrents out of the places where once it oozed. Yet it remains something of a mixed blessing. Today, not even the cleverest demon could pass the stuff off as harmless olive oil.



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By James Shreeve

The deepening conundrum of Neanderthal Man

A skeleton named Moshe and a new theory stir debate about this long-scorned hominid and its possible coexistence with modern humans

Moshe's head is missing, and everybody wants to know why. His body has been found on Mount Carmel, in a cave open to the breeze off the Mediterranean, a mile to the west. When he was buried, a long time ago, the sea was several miles farther away, wild cows roamed the coastal plain between, and Moshe was still in possession of his head. But somehow he lost it, a week, a decade or a millennium later.

Moshe is a Neanderthal. His nickname is the gift of the Israeli and French archaeologists who brought him out of the cave a few years ago. Missing parts notwithstanding, his fossilized bones represent the single most complete source of information on what Neanderthal bodies looked like. The cave is called Kebara. On this morning in mid-July, it may be the coolest spot in the state of Israel—a good place to be if your occupation involves long days of hauling dirt around in buckets or scraping the soil with a trowel. Later, when the sun passes the meridian and penetrates the mouth of the cave, the work will heat up. A distinct "tan line" separates the diggers at Kebara: those who work in the shadow of the cave stay baby-white, while those who toil in the path of the afternoon sun quickly bake to the color of a baby's bronzed shoe.

For most people, the mention of "Neanderthal" brings to mind the image of a hulking brute, dragging his mate around by her hair. To experts such as those who work at Kebara, the name represents something much more compelling. The Neanderthals were a type of human that flourished throughout Europe and western Asia well into the Ice Age. What makes a Neanderthal a Neanderthal is a suite of exquisitely distinct physical traits, including massive limb bones; a barrel chest; thick brow ridges; a huge, protruding face and nose; a receding forehead; the absence of a well-defined chin; and a bunlike bulge on the back of the skull. Despite a reputation for dim-wittedness, there is nothing that clearly distinguishes a Neanderthal's brain from that of a modern human being except for the fact that, on average, Neanderthal versions were slightly larger. Combining enormous physical strength with manifest intelligence, Neanderthals appeared to be supremely well adapted.

Nevertheless, around 35,000 years ago they vanished from the face of the Earth. Their disappearance coincides with the arrival of modern-looking people in Europe, known as Cro-Magnons. (Cro-Magnons, along with other hominids with anatomy like our own, are now collectively referred to as modern humans.) What happened to the Neanderthals? Who were they? Were they like us, or a different kind of human altogether? Did our modern ancestors cohabit with them or kill them off? Did Neanderthals possibly evolve into mod-

David L. Brill (and following 4)

Differences in facial features of modern man, such as Cro-Magnon (opposite), and Neanderthal (above) are clear from skulls. Receding forehead, bulging brow, large nose hole, bigger face, distinguish the latter.

ern people? These are the most talked-about questions in human origins research today. There are few hard answers, but the oafish image of Neanderthals is abating, at least among scientists. Because of advances in methods of dating fossils like Moshe, and a controversial theory that suggests modern man originated in Africa, not Europe, there's hardly a paleoanthropologist today who does not have an opinion to offer. But surprisingly few are out in the field, digging for answers.

To reach the Paleolithic Age in Israel, you need only rent a car at Ben Gurion Airport and drive an hour or two up the coastal road. The Kebara Cave hangs off a steep slope just above a banana plantation; a large, airy cavern, its volume has been nearly doubled by years of meticulous excavation. From the naturally vaulted ceiling hangs a wire grid that bestows a fragile logic upon the layers of deep time exposed beneath. Scattered through the excavation's three dimensions are a dozen or so scientists and students; an equal number work at tables along the rim. The atmosphere is one of hushed, almost monkish, engagement, like the reading room of a great library. Occasionally you can hear muted discussions in three languages—Hebrew, French and English—but most of the diggers here are absorbed in the

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Moshe's skeleton was found headless, but had been put in a shallow pit, with his arms folded on his chest, suggesting formal burial rites.

square meter of mystery directly under their eyes.

"People here get a lot of credit for independent thinking," says Lynne Schepartz, now a paleoanthropologist at the University of Arizona. "It's not one of those sites where you dig until you find something and then go ask the boss what to do with it."

Today Schepartz is excited by a slip of bone in her tray, small enough to fit in a medicine capsule. It might, just might, be the fingertip of a human infant. Along with a couple of tooth fragments, the little fossil has turned up in a crevice along the opposite wall of the cave. She squints at it for a moment, then shrugs—there is too little there to make a positive ID. Eight years ago, while still a graduate student at the University of Michigan, Schepartz found something a bit less ambiguous. Kebara had last been excavated in the 1960s, and her assignment was to clean up the old exposures by cutting them a little deeper. One morning her whisk broom exposed an array of human teeth. It was Moshe's lower jaw. The previous excavation had missed it by inches. From the neck down, Schepartz's find was indeed the single most complete Neanderthal skeleton ever found. Even so, Moshe's discovery was not exactly headlines. Neanderthals have been known since 1856, and public attention was focused elsewhere, on the emergence of the very first members of the hominid family millions of years earlier. In the late 1980s, however, two developments combined to push Neanderthals back into the limelight. In 1987, some biochemists at the University of California at Berkeley announced that their study of a particular kind of DNA revealed that all living human beings shared a common ancestry with a single female who lived in Africa some 200,000 years ago. Inevitably dubbed the "Eve hypothesis," the study gave an unexpected, highly publicized boost to a controversial scenario of modern human origin known as "replacement."

James Shreeve, coauthor of Lucy's Child, *lives in France and is at work on a book about modern humans.*

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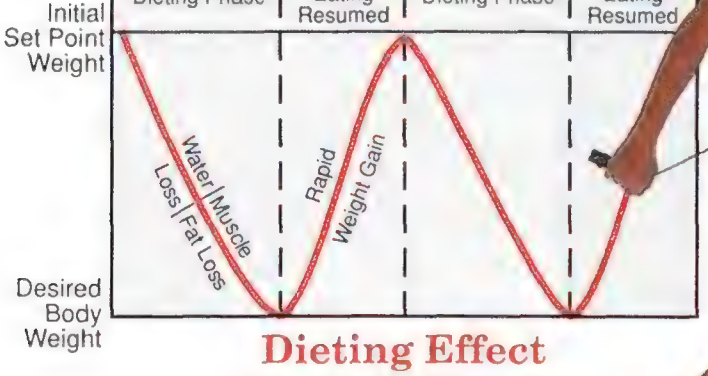

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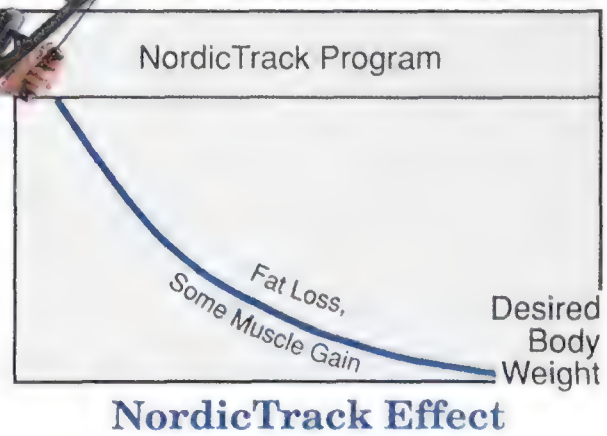

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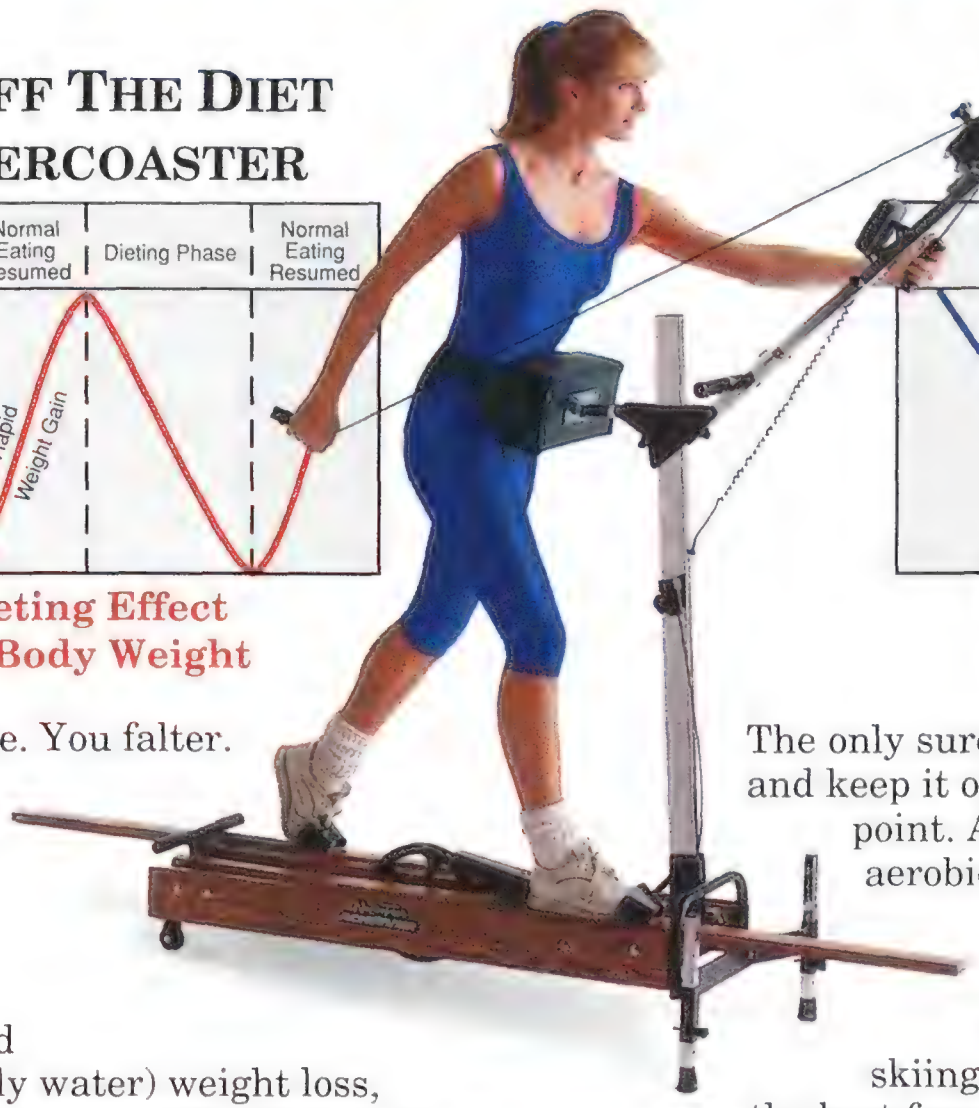

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In this version of our species' birth, modern humans from Africa moved up from their homeland some 100,000 to 40,000 years ago, outcompeting, outfighting, outreproducing or otherwise menacing into extinction every other human population they encountered—including Neanderthals like Moshe. This "out of Africa" theory flatly contradicted the then prevailing view, which claimed that the Neanderthals did not go extinct at all, but instead evolved into today's Europeans and Middle Easterners.

Whichever theory turns out to be right, the Eve hypothesis has prompted archaeologists and anthropologists to peer more intently into the dark vestibule of time that lies just before the appearance of recognizably modern culture, some 35,000 years ago. A second development, even more significant, shines a light directly into that darkness. To understand how one sort of human is related to another, or how new ways of living were introduced into the repertoire of human behavior, it helps to know how old things really are. For decades, the radiocarbon-dating technique has

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Harvard professor Ofer Bar-Yosef conducted his first dig at the age of 11.

been able to provide absolute ages—but only on materials younger than 40,000 years. A similar method exists to date fossil-bearing deposits older than half a million years. But the time in between—precisely the period harboring the origin of modern humans—has until recently fallen into a sort of chronological sinkhole. Now, thanks to refinements in new dating techniques, the drama of our species' birth is emerging from the shadows.

Take Moshe, for instance. When Neanderthals were first discovered in Europe, they were judged to be primitive ancestors of modern people, if such massively built, beetle-browed brutes could be granted ancestral status at all. In contrast, the taller, more slender Cro-Magnon people uncovered in France a few years later were quite easily accommodated onto the main trunk of the human family tree. Not only did they look like us, but they also appeared to have behaved in a more acceptably modern fashion: their stone tools were more varied and sophisticated than those of the Neanderthals; they also made tools from bones and antlers. Perhaps most important, they seemed to have discovered a symbolic plane of existence, expressed in cave art and Venus figurines, and in the beads and pendants adorning their bodies (SMITHSONIAN, October 1986).

Ever since, it has been all too easy to regard Neanderthals as the primitive condition, and modern-looking people as either their descendants or as a superior group of people who arrived in Neanderthal territory and drove them to extinction. Here in the Middle East, however, the cultures of the Neanderthals and of modern humans found nearby have long been known to be virtually indistinguishable. The moderns used the same type of chipped-stone tools as the Neanderthals and hunted the same animals for food. Yet the assumption persisted: the big-boned, heavy-browed Neanderthals *must* have come first.

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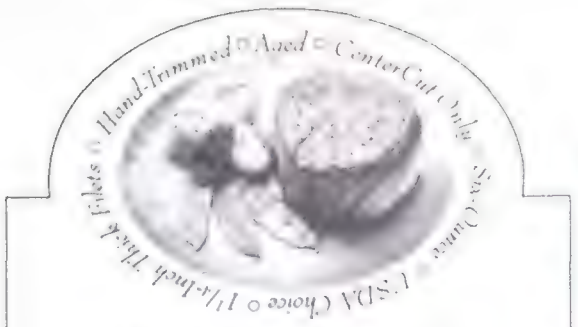

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Besides Moshe, Kebara Cave yielded thousands of stone tools and artifacts. Here archaeologists screen soil for fragments.

cist with the French-Israeli excavation team applied a new absolute-dating technique to Kebara and some other sites in the Levant. (Called "thermoluminescence," the method essentially counts the number of electrons trapped in the microscopic crystal structure of a burned flint tool or other object since its first exposure to heat. Because the electrons become trapped at a steady rate, counting them provides an estimate of the amount of time that has elapsed since the substance was heated.)

Based on Kebara artifacts, the scientists tagged a date on Moshe of 60,000 years—not unexpected, since it is well within the period that Neanderthals were thought to inhabit the Middle East. The surprise came later, when the team used thermoluminescence to date some modern human skeletons found at a site called Qafzeh, just an hour's drive inland from Kebara. This time, the date of burial came up somewhere around 92,000 years—more than 30,000 years *before* Moshe. Other studies confirmed the import: in the Middle East, at least, modern humans are many millennia older than their purported Neanderthal "parents."

What this evolutionary flip-flop means is a matter of great puzzlement and loud debate. Everyone agrees on one thing: if the new dating methods are accurate, then the Neanderthals, long overlapped with modern humans, clearly can't be regarded simply as more-primitive versions of ourselves. But this only deepens the mystery of the relationship between us and them. Did they coexist with modern humans in the Levant, even mate with them? Or were they driven off the face of the Earth by the slender people arriving from Africa, as the Eve hypothesis suggests? And, if Neanderthals were not our ancestors, can we properly call them human at all?

Perhaps Moshe can at least answer the last question. Because so many Neanderthal skeletons have been found in relatively good condition, most scientists believe that they buried their dead. Deliberate burial is a uniquely human habit, resonant with overtones of religious awakening and visions of an afterlife. Though headless, Moshe was found lying on his back in a shallow pit, his right arm neatly placed across his chest and his left arm across his stomach. There seems little doubt that a skeleton could remain so peacefully articulated after

death, if it had not been deliberately protected from the jaws of hyenas and other scavengers.

Moshe's bones provided a feast of new data on Neanderthal anatomy. The first complete pelvis of any early hominid. The first complete spinal column. The first complete rib cage. Moshe's pelvis proved wrong the earlier hypotheses that Neanderthals had longer pregnancies than modern humans and gave crucial information on their adaptations for walking.

No bone in Moshe's body spoke more to the question of Neanderthal "humanness," however, than a tiny structure in the throat called the hyoid. Shaped like a miniature saddle, the hyoid serves as an anchor for muscles connecting the jaw, larynx and tongue. The anatomy and position of the hyoid in Homo sapiens is implicated in that most human of attributes: speech. The hyoids of our indisputably speechless relatives, the gorillas and chimpanzees, are shaped differently and located higher in the throat than are those of adult humans. Based on other anatomical evidence, some scientists had previously maintained that Neanderthals would also have been endowed with apelike hyoids, and consequently, limited speech abilities. Some have even speculated that modern humans from Africa replaced the Neanderthals because they had the advantage of fully developed language. But in size and shape Moshe's hyoid, the first to be found in a prehistoric hominid, resembles that of people living today. Exactly where it was positioned in his throat, however, remains unresolved.

On this July morning, Moshe's grave is occupied by a fully modern human named Ofer Bar-Yosef. One of the ten directors who organized and executed the Kebara project, Bar-Yosef is perfectly adapted to the environment of an archaeologist. He is nimble and compact, the better to crawl into cramped spaces, and he is endowed with the resilient curiosity needed to succeed in a field where all answers

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Prof. Tal Simmons works in Kebara Cave amid wire and string grid used to keep track of where specific objects were found.

will be tentative and most mysteries will remain forever unsolved. Now at Harvard, Bar-Yosef directed his first archaeological excavation at the age of 11, rounding up other youngsters in his Jerusalem neighborhood to help him dig a Byzantine site a couple of blocks from his house. He has not stopped digging since.

The Kebara project was conceived by Bar-Yosef and his colleagues as an ambitious test of an unfashionable hypothesis. A few years before the site was dated by thermoluminescence, he and his colleague Bernard Vandermeersch, of the University of Bordeaux, put forth the then outlandish idea that the modern human skeletons of Qafzeh might be as old as 100,000 years, and thus could not have evolved from the Neanderthal population in the Middle East. Their hypothesis met with the response that often greets opposition to conventional wisdom. It was ignored.

"The only way we could persuade people that our suggestion was serious was to put together another project,

somewhere where there was a long cultural sequence," Bar-Yosef explains. "Kebara was the obvious choice."

Bar-Yosef adjusts a hanging light and squats to scrape a skin of sediment off the remains of an ancient hearth. The scientists' goal in this deepest part of the excavation is to dig until they find another Moshe—or reach bedrock, whichever comes first. So far, the sediments appear "sterile"—empty of fossils or stone tools. But on the way down, the team has found abundant evidence of fire. Kebara is thick with Paleolithic hearths, visible as pockets of black and gray ash tucked among the brick-red sediments.

"There seems to be a regular pattern to many of these hearths," says Bar-Yosef. "We find a burned area, then a clean area, then some bone debris. I don't know what to make of it." He pokes his head out of the pit and calls to a geologist, an expert on ancient hearths. A conference begins.

Tal Simmons, now an assistant professor at Western Michigan University, sits about ten feet away, presiding over another mystery. In 1986, she uncovered here a curiously dense layer of broken-up animal bones and stone

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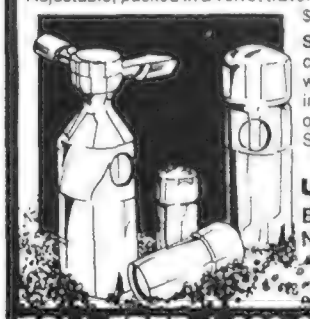

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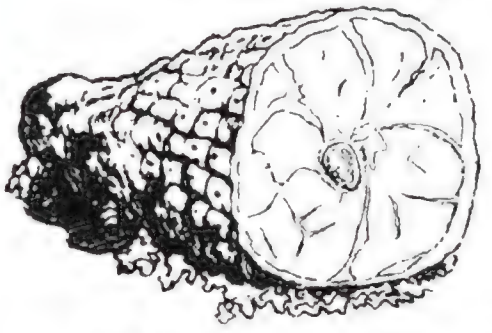

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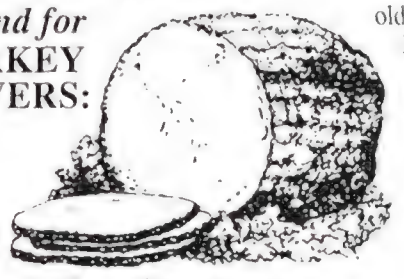

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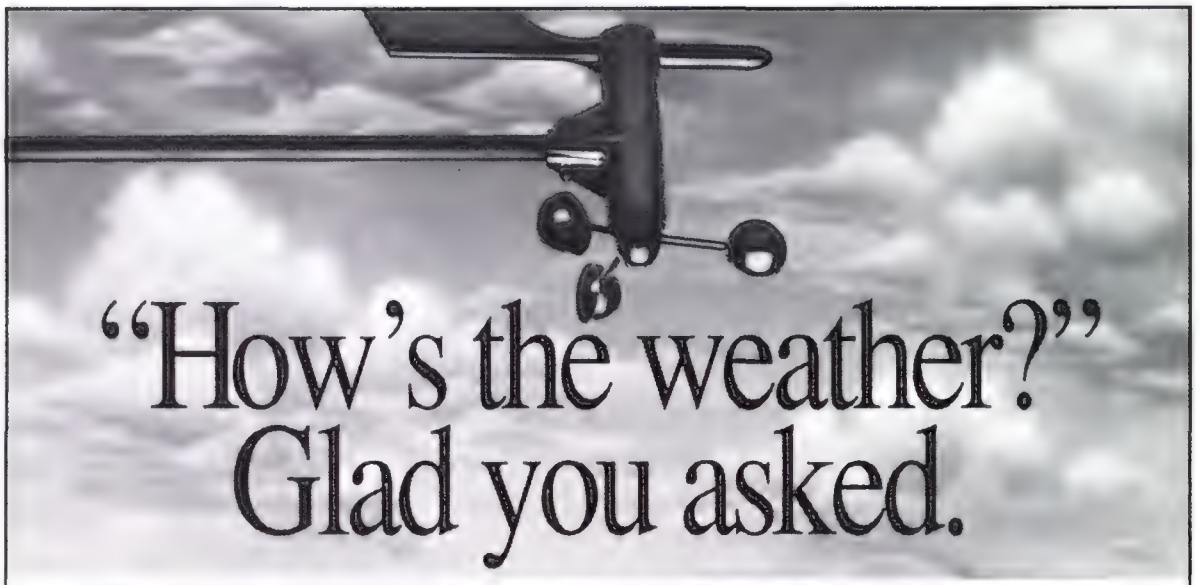
tools. As Simmons dug, a layer became a pocket, the pocket a massive archaeological lode about a foot deep.

This jumble of debris is far more on the minds of the archaeologists than is the location of Moshe's head. The crux of the mystery is that the edges of the excavated site do not fade out but end abruptly, almost as if someone had dug a pit and dumped everything in. Is this really a sign of intense human occupation? Or is it the product of natural causes, like water flow or hyena denning?

"This is the only place in the cave where the bones show a lot of what we call cut marks—the scratches left on bone by butchering with stone tools," says Simmons. "My feeling is it's some kind of refuse area." Faunal expert John Speth, of the University of Michigan, has been brought in to help puzzle out the meaning of the concentration of bones, by identifying the animal species represented in them, looking for tool or gnaw marks on their surfaces and poring over site charts with Simmons. "We may be looking at a Kebara trash pile," Speth says. "But we've got to eliminate any other possibility first."

Along one rim of the cave there is



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an array of shelves, and in front of them some long benches. The niche thus defined is the workplace of the archaeologists, mostly French, who are processing the thousands of stone implements brought up from below. Their task is to record the location and type of the tools, the kind of raw material used, the technological method expressed by the form, and whatever other minutiae of interest can be gleaned from their raw surfaces. All this data, multiplied by the thousands, will help reconstruct the lifeways of the Kebara people. But so far, it does not reveal anything about the way Neanderthals here differed in their behavior from the modern humans at Qafzeh, or at a nearby modern human site called Skhul.

"Looking at stone tools, you can get an idea of how people prepared food, and in this activity there is no difference in the Middle East between Neanderthals and modern humans," says Bar-Yosef. "But is what you do in the kitchen *all* of your life? Of course not."

At 10 o'clock somebody blows a whistle and the crew breaks for biscuits and coffee—strong local stuff laced with cardamom, drunk while milling around a table in a cool recess near the rear of the cave. Above, the bats in the chimney keep up a perpetual squeak of protest against this latest human occupation.

The bats are a reminder that caves have always been called home by a great many creatures not remotely ancestral to humans. In some cases, the co-cave dwellers create problems, like the porcupine whose burrows were obliterating the carefully excavated stratigraphy at another Mount Carmel site. (Local Druze hunters were hired to dispatch the porcupine. They cooked and ate it on-site.) But cave fauna can also be an enormous archaeological boon. Barn owls and other predatory birds live and eat in the caves, and have been doing so for many thousands of years. The undigested bones of rats, mice and other rodents left behind in their droppings record the comings and goings of micromammals into the region through the millennia. Since different species of rodents are adapted to different sorts of habitats, rodent bones in the caves become a sort of ledger of environmental change through the past.

By reading between the lines of that ledger, Bar-Yosef and paleontologist Eitan Tchernov, of Hebrew University of Jerusalem, may have discovered a crucial clue to the relationship of Neanderthals and modern humans in the Middle East. The micromammals found at Kebara and other nearby sites associated with Neanderthals are the species adapted to a cooler, wetter, more temperate environment—the kind that prevails now east of the Mediterranean. While at Qafzeh, where the modern humans

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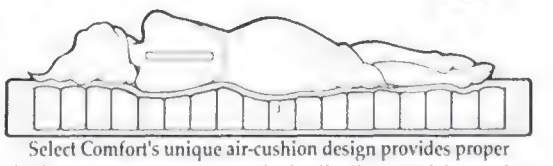

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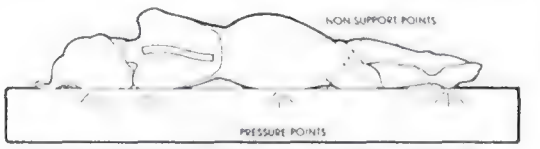

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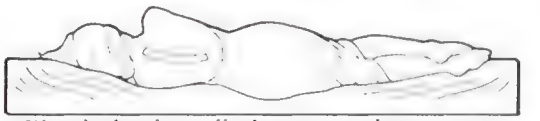

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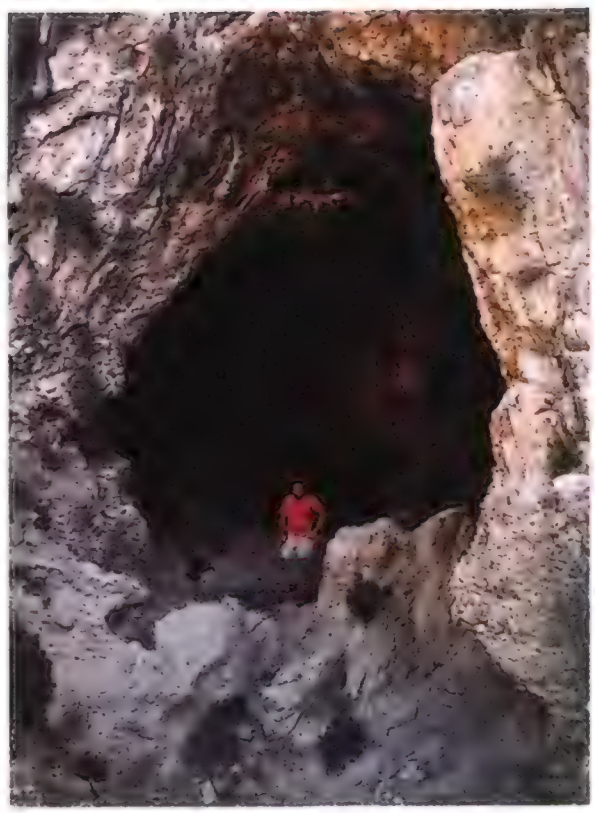
were found buried, the micromammal record reveals that conditions then were hotter and drier, more like those of today's sub-Saharan Africa.

One hypothesis that emerges is of a grand "time-sharing" in the Levant. In periods during which the climate became more tropical, heat-adapted modern humans moved in from the south. Likewise, when the Levant cooled off, Neanderthals migrated in from the glacial north and modern humans retreated south to where conditions suited them better.

This version of events in the Levant bestows upon the Neanderthals something precious often denied to them in the past: equality. Far from being the inevitable victims of a superior race, they appear to have been as successful in their own environment as the modern humans were in theirs. According to John Shea, one of Bar-Yosef's colleagues at Harvard, if either group had a competitive edge over the other in the Levant, it was probably the Neanderthals. "An adult Neanderthal like Moshe," says Shea, "is a creature vastly stronger than the strongest NFL lineman. These guys could have butchered a gazelle with their bare hands, just torn it limb from limb."



John Shea stands in Qafzeh, where a 92,000-year-old modern was found.

Neanderthals worked stone with bone; tools may have had wooden handles.

Shea is careful to avoid the old, false logic of using Neanderthal physical strength as a sign of mental weakness. "Part of the received wisdom is that Neanderthals couldn't haft tools. If you ask why not, you're told 'Because they weren't smart enough.' And how do we know they weren't smart enough? 'Well, because they couldn't haft tools.' "

Shea has challenged such circular reasoning with a study of the microscopic traces of wear on the edges of thousands of tools from Kebara and Qafzeh, which can show what sort of use the tools were put to. Some from Kebara, presumably made by Neanderthals, show just as much wear characteristic of hafted spear points as do those made by moderns at Qafzeh. "Neanderthals were making and using projectile points like crazy," says Shea. "They were probably as good at hunting as the modern humans."

We are left, then, with the fascinating possibility that two kinds of humans, both with large brains and both equipped with virtually the same bag

of technological tricks, lived in the Middle East at about the same time during periods of climatic transition. What happened when they met face-to-face? Did one view the other as a disquieting threat, a bothersome, malformed intruder competing for game? Or did they sit at one fire, swapping information, expertise and occasionally mates? How different were they? How much the same?

Some anthropologists, with one eye on the identical cultures, argue that the names "Neanderthal" and "modern human" artificially divide a single, interbreeding population. If the two types interbred to any lasting extent, however, as time went on one would expect to see a gradual mingling of anatomical traits. So far, no "Neander-mod" has turned up in the Middle East and not conclusively anywhere else. If anything, the later Neanderthals are even more exaggeratedly "Neanderthalish" than the earlier ones, supporting the contention of those anthropologists who think that they represent a wholly different species from modern humans. If that is true, then perhaps when the two met they did not recognize each other as potential mates, or if they did, their mating produced no fertile offspring.

In any case, it probably would not have been the first time that more than one hominid species shared a given place at the same time. There may have been as many as four or five different hominids wandering around on the East African savanna some one and a half million years ago. What makes the chronological overlap of Neanderthals and modern humans in the Middle East so compelling is that these particular hominids were equally endowed with the capacity to spread their reach over the edges of the Earth. Except for some accident of climate or—who knows?—microbial infestation, there might be inquisitive Neanderthals today, puzzling over the remains of the extinct, curiously thin-boned people who, for a time, shared a piece of their planet.

In the end, all defense of Neanderthal prowess must face this ineluctable fact: we are here today, and they are not. Some 50,000 to 45,000 years ago, modern humans from the south apparently took possession of the Levant. They continued northward and spread out. But 10,000 years later the Neanderthals had vanished.

It would be gratifying if that successful wave of modern humans had left behind some trail revealing the secret of their triumph. But the archaeological record, alas, is not so obliging. No stunning advance in weapon technology is to be seen in what was left in the Middle East 50,000 years ago; no art, beadwork or other manifestation of an exploding new "humanness" has yet been uncovered from that time. The absence of hard evidence makes many archaeologists skeptical that the migration out of Africa ever happened. Others, like Ofer Bar-Yosef, are simply skeptical of our ability to know. "The evidence for these things is missing," he says. "Being positive people, we don't admit to ourselves that some of that evidence may be lost forever. So we keep on looking."

In the glow of a cave fire, Neanderthals communicate by emoting in diverse ways. Portrait was painted by artist-anthropologist John Gurche for Smithsonian book *In the Age of Mankind.*

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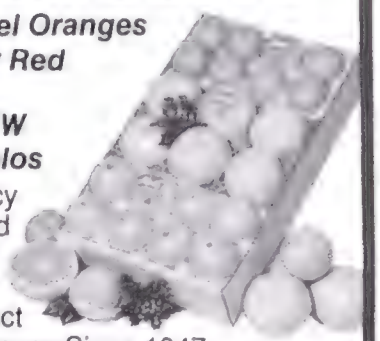

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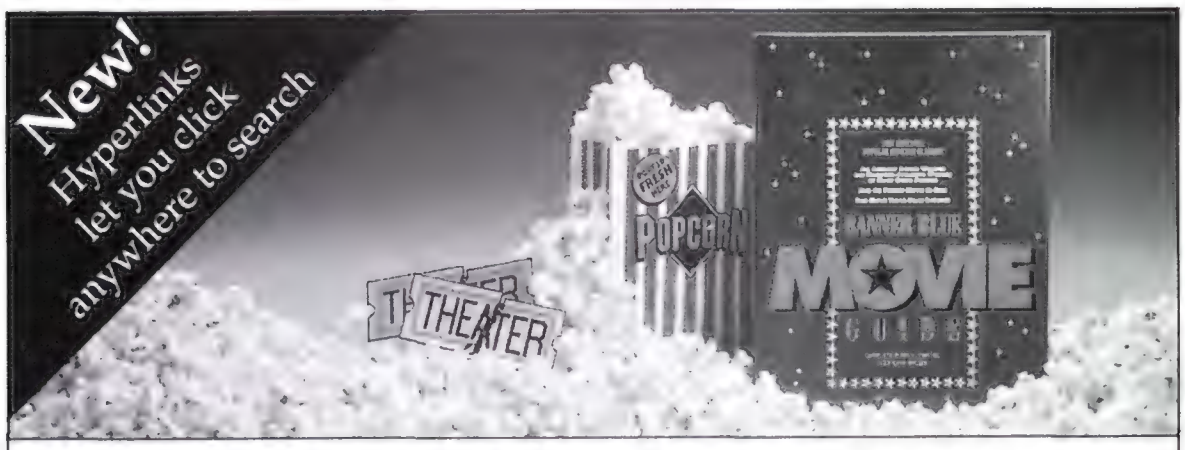

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Book reviews

The Edge of Paradise
P. F. Kluge
Random House, $21.95

They say the tiny islands of Micronesia, little jewels in the vast Pacific, are timeless places. I suppose that's true—the never-changing beaches, the always riotous growth. But what also is true is the wreck the islands have become. I wrote a book about that wreck once, blaming it on American administration, but now I think it is inherent in the terrible dislocations of an island people with Stone Age skills coming abruptly into the modern world. And it doesn't change. Ten years after my book, the CBS News program *60 Minutes* discovered Micronesia and did a breathless takeout on the ruin.

And now P. F. Kluge, recounting a trip made in 1989, nearly a quarter of a century after his own tour there as a Peace Corps volunteer, reports, in essence, that nothing has changed. But that said, let me add that Kluge does it with charm, panache, a tremendous affection for the islands, a capacity for self-analysis, and very graceful prose.

The Edge of Paradise is a pleasure to read, full of handsome description. You may weary of Kluge's voice before he does—the book is relentlessly personal, but stick with him. The intimate and informal picture he gives you effectively delineates a destroyed society.

Kluge first went to Micronesia in the mid-'60s. Already a writer (he now has several books), he was pressed into service by the Micronesian government, and there he met Lazarus Salii and became friends. Salii was young then too, and full of enthusiastic hope for his people. In time he became president of

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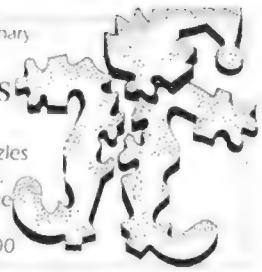

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Palau, farthest and strangest and most complex of all the islands (SMITHSONIAN, September 1986). He would call Kluge at night sometimes, halfway around the world, to talk of old dreams.

The book opens with Salii's suicide. The writer, now older and a bit jaded, knows he must return. He owes it to his friend to see his grave and search out a meaning for his death. He makes an extended tour of the islands, visiting all the island centers and talking to old friends, asking the same question. He purposely goes last to Palau, always the most mysterious, and when he finally gets there, he isn't asking any longer why Salii died. He knows.

The Micronesian islands are some 2,000 specks, land area totaling about 717 square miles, thrown over 2,000 miles of the far Pacific—home, when I was there, to 90,000 people who spoke nine mutually unintelligible languages, and now divided arbitrarily into six jurisdictions. Magellan stopped for water, and Spanish plate fleets followed. Spain was ousted by Germany, Germany by Japan, Japan by the United States in some of the most violent battles of World War II. After the war the United States managed the islands as a "strategic trust" of the United Nations; now quasi-independent, they remain more or less wards of the U.S. Government.

For millennia, life on these islands was in balance, reef fish and taro and breadfruit in equilibrium with the people's needs. The imperatives of life on a small island shaped an effective culture. Then modern times brought an industrial revolution. But island culture did not adapt to time-oriented demands.

When I was there, about half the people worked for the government and the others scarcely worked at all. In such

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a society, despair is inevitable. They were sad islands for all their paradisical beauty, beer the main interest, the alcoholism rate soaring . . .

Kluge never got the islands out of his system. He stayed in touch, visited, helped the islanders with United Nations appearances. Now his lively, bright-eyed, anything-is-possible friend is dead by his own hand. So the author sets out—the Marshalls, Ponape, Truk, Saipan, Yap and, finally, Palau.

He has written a reminiscence, a travelog, a paean to the islands' beauty, a search for self and youth and hope by a man older now, cynical and naive at once, an examination of the complex society and its incredible problems—and finally, he has written about a love affair between himself and an impossible mistress, a place, an idea, a dream. The result is a book written from the heart, one of those books, one suspects, that a writer writes finally because he must.

At last he reaches Palau, but now there are no more questions. He has his answer and it is the answer of the whole. As he puts it, "Islands turned smaller and smaller, sinking under the weight of dreams they could not sustain." Salii died of despair, the same despair I found and Kluge found at first and now much more, the despair sinking the islands of paradise.

Connecticut-based *David Nevin* is author of *The American Touch in Micronesia.*

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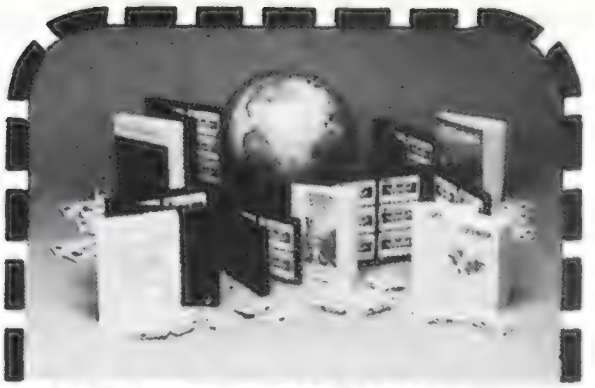

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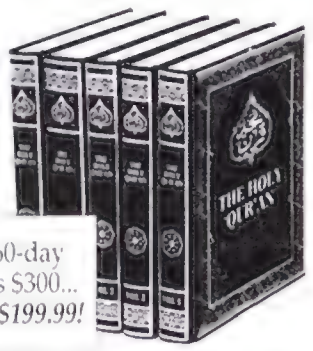

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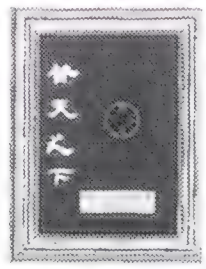

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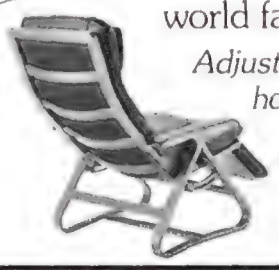

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Begin your visit at the Smithsonian Information Center, located in the Castle. Hours are 9 A.M. to 5:30 P.M. daily.

Holiday events

Traditions of Christmas, Hanukkah, Kwanzaa and the New Year will be observed at the National Museum of American History's annual Holiday Celebration, December 26-31, noon to 4 P.M. daily. Call (202) 357-2700.

Special December exhibits and events

Cooper-Hewitt Museum (New York)
The Cooper-Hewitt Collections: A Design Resource (through August 1992) Exhibition chronicles the history and collecting philosophy of one of the world's most important repositories of design. See *Highlights continued*, page 136.

National Museum of the American Indian (New York)
A Gift from the Heart: Two Pomo Artists (through December) Baskets and ethnographic models by California Pomo artists William and Mary Benson.

National Museum of Natural History
The All-American Horse: Paintings of G. Harvey (December 6-September 7, 1992) An homage to the historic role of the horse in North America.

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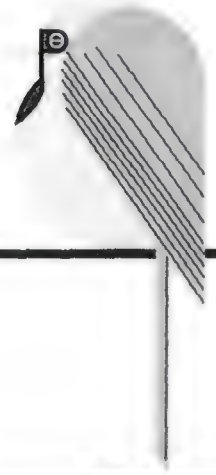

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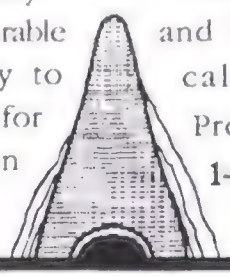

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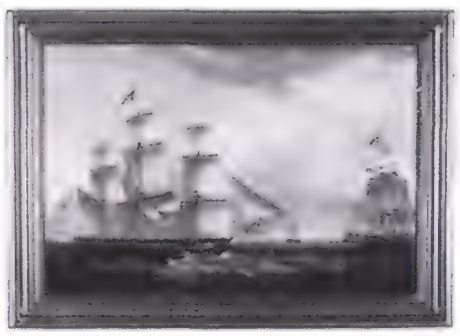

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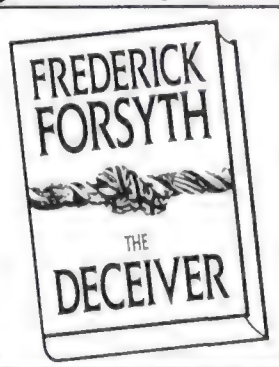

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Darkened Waters: Profile of an Oil Spill (December 13-April 19, 1992) Exhibit documents environmental impact of the 1989 *Exxon Valdez* disaster.
Seeds of Change (through April 1, 1993) Major exhibition explores changes brought about by the exchange of five "seeds," begun 500 years ago, between the Old and New Worlds.

National Museum of American History
Trees of Christmas (December 14-January 5, 1992) Ten trees illustrate particular time periods, ethnic traditions or styles.
Desert Storm: A Photographic Diary (through January 12, 1992) The eye of the storm. More than 100 photographs.

National Air and Space Museum
Legend, Memory and the Great War in the Air New permanent installation looks at the reality of aviation in World War I. See *Around the Mall*, page 18.
Antarctica (6 P.M. daily through May 29, 1992) New Imax film explores mysterious beauty of southernmost continent.

National Museum of African Art
The Art of the Personal Object New permanent exhibition examines the forms and functions of utilitarian objects from Africa.

Arthur M. Sackler Gallery
The Art of Painting a Story: Narrative Images from Iran (December 22-May 10, 1992) Illustrative paintings from the Vever Collection.
Challenging the Past: The Paintings of Chang Dai-chien (through April 5, 1992) The work of one of the 20th century's foremost Chinese painters.

Hirshhorn Museum & Sculpture Garden
Recent Acquisitions: 1989-1991 (through January 5, 1992) Paintings, sculptures and works on paper by such artists as Francis Bacon, Joan Nelson, Ed Ruscha.

National Museum of American Art
Gene Davis (December 14-March 1, 1992) Installation of nine works by one of America's most innovative and accomplished 20th-century painters.

Renwick Gallery
Albert Paley: Sculptural Adornment (through March 22, 1992) Jewelry from the 1960s and '70s by the master of architectural ironwork.

National Portrait Gallery
TIME Covers the War: Personalities from World War II (December 7-May

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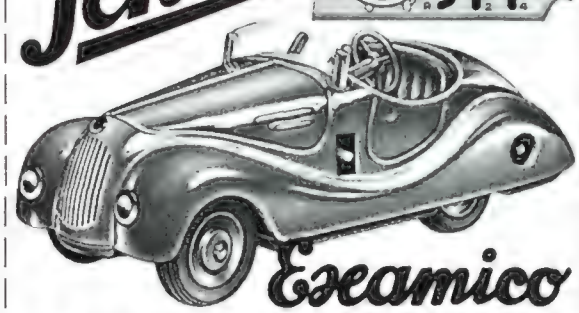

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17, 1992) Original portraits commissioned for the covers of the news magazine. *Collecting Portrait Prints: Washington Print Club Biennial* (December 17-May 17, 1992) Fifty-four portrait prints.

Arts and Industries Building
Experimental Gallery
Finding Your Way: A Historical and Hands-on Approach to Navigating (through January 31, 1992) Exhibit from San Francisco's Exploratorium.

International Gallery,
S. Dillon Ripley Center
Degenerate Art: The Fate of the Avant-Garde in Nazi Germany (through January 5, 1992) Artworks originally assembled by the Nazis for their 1937 "Degenerate Art" exhibit (SMITHSONIAN, July 1991).

Exhibition catalogs

Catalogs available currently include:
Seeds of Change (paper, $24.95; cloth, $39.95)
To order, send check or money order to Smithsonian Museum Shops, 8308 Cinderbed Road, Newington, Virginia 22122. Include 15 percent of purchase to cover postage, handling (minimum, $1.75).

Smithsonian on the air

Christmas Oratorio: A three-hour radio special of J. S. Bach's Christmas Oratorio performed by the Smithsonian Chamber Orchestra and Chorus. Check local public radio listings.

Resident Associate Program

To become a Resident Associate, or for fee and ticket information, call (202) 357-3030. December events include:
The Fate of the Avant-Garde in Nazi Germany (December 7; 9:30 A.M. to 5:30 P.M.) All-day seminar concluding with a private viewing of the "Degenerate Art" exhibit.

Smithsonian Institution Traveling Exhibition Service

SITES organizes and circulates exhibitions to cities throughout the United States and abroad. To sponsor a show in your community, write SITES, Smithsonian, Washington, D.C. 20560. December exhibits include:
• Boston, Massachusetts (December 14-March 8, 1992) *Inside Active Volcanoes: Kilauea and Mount St. Helens*, Boston Museum of Science.

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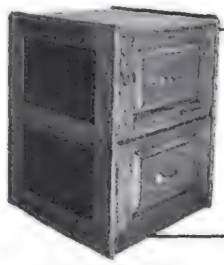
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A panorama of design history

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"The Cooper-Hewitt Collections: A Design Resource" showcases more than a thousand of the quarter-million objects in the museum. Alongside the more traditional examples of decorative arts—furniture, glassware, ceramics, metalwork—is an eclectic array of surprises: Victorian bird cages, Florentine tarot cards, biscuit tins, bandboxes, perfume bottles, appliances, trade catalogs and costume designs. In one section, titled "Winged Things," all manner of flying creatures (both real and imagined) adorn items from cocktail shakers to thrones.

Founded in 1897 as a "visual library" of design, the Cooper-Hewitt has become an invaluable resource for scholars and designers worldwide. This exhibition, which can be seen through August 1992, demonstrates why.

Diane M. Bolz

Fanciful 19th-century American bird cage belonged to museum's founders—Sarah, Amy and Eleanor Hewitt.

Dubbed "Valentine," sleek portable typewriter was designed in 1969 by Italian Ettore Sottsass jr. and produced by Olivetti.

Lounge chair of corrugated cardboard (c. 1970) was inspiration of noted American architect Frank O. Gehry.

From Milan, Italy, this 1957 solution to the problem of coming up with comfortable seating playfully recasts familiar forms.

Striking profile of 19th-century bentwood rocker, made of beechwood and cane, was conceived and manufactured in Vienna by Thonet.

Watercolor rendering (1978) was done by architect Thomas Gordon Smith.

Necklace of metal beads, fiber, was made by Austrian Jacqueline Lillie in 1984.

Wallpaper, christened "The Cedar Tree," was designed in England c. 1910.

Elegant place setting is one of 18 embellishing table at end of show—an artful summary of collection.

One of many interpretations of pattern in the exhibition, this early 20th-century embroidered fabric from Zaire is made of raffia.

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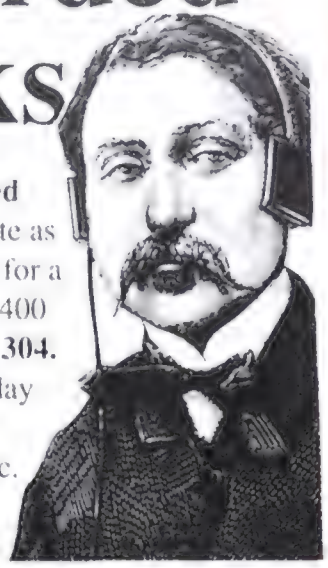

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Death Valley and Mojave Desert *March 20-29*

Gulf Coast Cruise *March 28-April 11*

Texas African Safari *April 1-5 or April 8-12*

Arizona in Spring *April 1-9*

Savannah and Charleston *April 3-10*

Sojourn in Sedona (Arizona) *April 9-15*

Jefferson's Virginia *April 10-16*

Rafting on the Rio Grande (Texas) *April 11-19*

Grand Canyon Weekend *April 23-26 or May 7-10*

Spring Gardens *May 1-9* Delaware Valley.

Okefenokee Swamp *May 3-8* Canoeing.

New York: Ellis Island *May 7-10*

Detroit Auto Barons *May 7-10*

Bryce, Zion and the North Rim *May 9-18*

Hudson River Valley *May 10-15*

Southwest Indians *May 23-June 2*

Grand Canyon Rafting *May 30-June 6*

Boston *June 6-10*

Chicago Architecture *June 17-21*

Foreign Study Tours

Australia-New Zealand *March 15-April 4*

Bermuda *March 19-23*

Indonesia Cruise *March 20-April 7*

Costa Rica *March 20-April 3*

Aztec Mexico *March 27-April 10*

Sea of Cortés Cruise *March 29-April 6*

Budapest, Prague and Berlin *April 1-12*

Morocco *April 4-18*

Durham (England) Country Stay *April 6-16*

Dutch-Belgian Cruise *April 11-30*

Central Asia (USSR) *April 12-23*

NEW Costa Rica Cruise *April 14-27*

Galápagos Cruise *April 18-29*

Treasures of the Nile *April 19-May 6*

Castles and Cathedrals of France *April 20-30*

Oriental Cruise *April 26-May 15*

Gardens of Northern Italy *May*

Countryside Tours *May-October* France, England, Wales, Czechoslovakia, Italy, Switzerland, Germany and Mexico.

NEW Crete, Rhodes and Santorini *May 1-16*

USSR Golden Ring *May 3-17*

NEW Spring in Kent (England) *May 7-19*

Czechoslovakia *May 7-22*

Italy Cruise *May 9-26*

Western Turkey *May 13-28*

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Denmark *May 20-June 2*

Swiss Country Stay *May 21-June 3 or June 4-17*

NEW Netherlands *May 28-June 8*

NEW Scotland *June 1-11*

Samarkand to Istanbul *June 3-21*

Pyrenees *June 5-15*

Cotswolds Walks (England) *June 11-22*

NEW Lake District (England) *June 11-22*

Inside Ireland *June 12-22*

Hikes in the French Alps *June 14-27*

Turkey *June 18-July 1* On the *Sea Cloud.*

Norway Fjords Cruise *June 23-July 3*

Mongolia *June 24-July 12*

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Sweden and Norway *June 25-July 8*

Russia by Train *June 25-July 12*

Smithsonian Seminars

Join top scholars for classroom study and tours. Courses are held in Washington, D.C. unless otherwise indicated.

Introduction to Rare Books *March 4-6*

Decorative Arts (New York) *March 19-22*

Churchill (England) *April 1-14*

Desert Storm *April 2-4*

Civil War at Fredericksburg *April 9-12*

Rome *April 15-27*

Landscape Design *May 3-7*

The Legislative Process *May 4-7*

USSR Update *May 6-9*

Civil War in Gettysburg *May 6-9*

The New Astronomies (Tucson) *May 10-15 and May 17-22*

Broadcast Journalism *May 13-16*

Greece *May 22-June 4*

Interior Design *May 31-June 3*

Paris *June 19-30*

Kenya *June 29-July 16*

Research Expeditions

Contribute your talent and financial resources to Smithsonian research. Work with curators at museums or in the field.

La Paz, Bolivia *March 7-18* Help organize collections of a new museum.

Washington, D.C. *March 15-24* Research exhibition on American musical theater.

Costa Rica *April 11-23 and July 11-23* Monitor an active volcano.

Front Royal, Virginia *April 11-25* Wildlife research in the Shenandoah Valley.

Las Vegas *April 26-May 8* Research giant tortoises of the Mojave Desert.

Edgewater, Maryland *May 31-June 9* Document environmental research.

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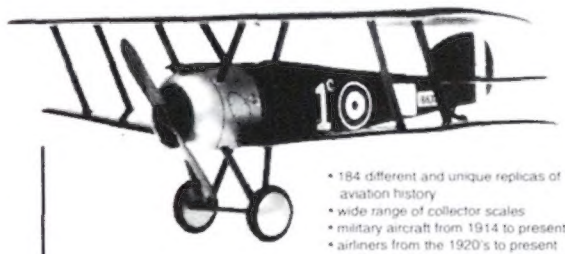

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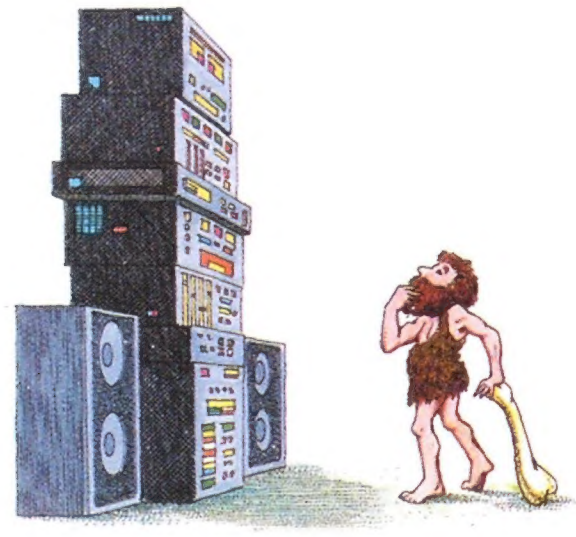
By Bruce Watson

All I really wanted was a low-tech hi-fi



Back before the dawn of the Quadriphonic Age, well before the Early Digital Epoch, I purged my pockets and bought a stereo, or in the parlance of the times, a hi-fi. It was a simple device—a few knobs and dials, a spindle turntable and a two-page manual. Through the years this simple sound system took me down music's evolutionary road, from the Beatles to Bach, from looking for the latest to taking solace in the greatest. But late last year, the old hi-fi curled up and died.

Left without sound to drown out a world growing louder each year, I had no choice. On a sale weekend, I strolled down to my local Sound Warehouse Showroom SuperWorld Ltd. to see what was new in hi-fis.

I was in no mood to splurge. I was looking for some old cracklin' wireless used only on Sundays to listen to the religious shows, and maybe a turntable with autoreverse for playing records backward to investigate Satanic messages. The basics. But the place was as big as a football field. It has, I learned, outlets in 125 cities and 17 countries, and will soon open one on Saturn.

Across a sweep of carpet scattered with stacked boxes, I could just make out in the distance a solid black wall that seemed to be pulsating. As I approached, I saw it was not solid but was made of component parts—receivers and decks with blue lights flashing, knobs and levers begging to be tweaked.

"Lookin' for something, sir?" The saleskid wore a gray suit and tie and an eager grin.

"I'm just looking for a simple hi-fi, radio and turntable," I warned him in monaural tones. "Nothing fancy. I can handle digital, I guess, but don't try to sell me any of this overhead cam, fuel-injected quadriphonic brouhaha, hey?"

The beaming, bespectacled boy, younger than my old hi-fi, stood before the wall of booming black boxes. "Checked out our specials yet? Just $149.88 gets you this Nokahoma 80-watt AM/FM stereo receiver with matrix surround sound, discrete amplifier circuitry, digital quartz tuning with 30 station presets and low noise pre-amp."

"Wrap it up," I said. "I've got an appointment in the real world."

"But wait!" He led me to bigger, scarier boxes. "No one buys turntables anymore. You'll be needin' a CD player with that. Just $229.88 buys this Hokalui 5-disc CD changer with 8X oversampling, and a dual 1-bit D/A converter."

I have traveled to dozens of countries. I have deciphered the epiglottal utterances of remote tribes. I speak several English dialects. But this was Esperanto in stereo, and little did I suspect that his "discrete" was not my "discreet." What could be discreet about amplifier circuitry? Did the cheaper models have indiscreet amplifier circuitry, circuitry that sidled up to you and said, "Gained a little weight, haven't we?"

"I Don't Speak Stereo!" I shouted. "Repeat—slowly—for—the—technologically—impaired."

The salesman began patiently explaining his terms. Here's what I could glean from his sound bites.

The latest craze in sound systems is surround sound. Remember how those old Beatles songs used to stay flat, pinned against the wall? Move just a few feet from the speakers and you couldn't tell Paul from John from Ringo, while George sounded like he was singing from somewhere in India. No longer. With surround sound, the music invades your living room, steals your wallet, soils the carpet, insults your family and causes quakes about 4.5 on the Richter scale.

"I'll take it," I said. "I've always wanted to be surrounded by some young starlet with shredded hair and no last name."

"But wait!" the salesman countered. "For only $299.88 you can upgrade. Check out this Sushibar 125-watt receiver with Dolby Pro Logic."

Pro Logic. Now there was a feature I could understand. My old hi-fi was totally irrational. I'd tune in a station one day at 88.5, the next at 102.3. Some days it came in over the microwave. My turntable was an empiricist, all right, but the balance knob was a sucker for situational ethics. This Pro Logic device, aside from having studied Descartes, had "a 7-band EQ with full memory [my old unit fumbled for its own name], a CATV antenna [for tuning in the Chronic Anxiety TV network], station index tuning [you can't find a station, you just turn to the index at the back], and much more." "Much more" was the intimidation factor. One look at this bold, black facade a full 12 inches high, guaranteed to whip any stereo on the block, and no stranger would dare diddle with your Dolby again.

"Sold!" I shouted in surround sound. "Ship that baby!"

"But wait!"

"Can't wait any longer," I said, with oversampling. "My circuitry is discreet. My digital is delayed. I may already be deaf. What more could I want?"

"Think you'll be wantin' any speakers with that?"

I panicked. I turned and ran but took a wrong turn and ended up at the TVs. I spent an hour frozen before a hundred cloned images of Oprah Winfrey discussing "Stereos that Kill!"

I barely made it out of my local Sound Warehouse Showroom SuperWorld Ltd. alive. Back to the world outside, where sound surrounds you 24 hours a day and the volume gets louder every year. It's not Pro Logic, but it's free.

When it comes to safety features, compromise is quite possibly the only thing you won't find in the all-new 1992 Toyota Camry. That's why a driver-side air bag* is standard on every single Camry model. More high-strength tensile steel was added throughout the entire body to enhance rigidity, ride and handling. Plus, stopping power has been dramatically improved, with enlarged rotor size and brake pad volume. All Camrys even offer an optional Anti-lock Brake System (ABS).

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